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In THE MUNICIPAL INDEX (the annual reference volume of data and condensed catalogs published by the American City Magazine Corporation) readers will find much material, including lists, and articles on a wide variety of municipal and civic subjects, not published in the monthly issues of the magazine.

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WORLD'S LARGEST WATER DEVELOPERS

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Public Works—Housing—R. F. C. Loans

Tax Report Scores False Economy

"CURTAILMENT or elimination of essential functions has little to commend it. If a municipality abandons the collection of ashes and garbage, for example, some private agency will immediately render the service, and in all probability at a greater cost. Generally speaking, the same is true of most municipal functions; they are functions that must be carried on if the community is to continue at its present stage of civilized development. If they are abandoned, the cost is simply transferred to the community through some other channel. Abandon police protection, and the cost of crime goes up; abandon fire protection, and not only will fire be uncontrolled, an unthinkable condition, but fire insurance rates will at once leap to prohibitive heights.

"Close the schools, and the next generation pays for the folly of this one. Close the libraries, and the unemployed will turn to other and less desirable ways of occupying their time. It is obviously false economy either to curtail such services to the point where they are no longer rendered adequately or to drop them altogether."

—Excerpt from Third Report of the New York State Commission for the Revision of the Tax Laws, submitted February 15, 1933.

New Jersey Makes Housing a Public Utility

BY the enactment last month of what is to be known as "The Public Housing Law," New Jersey has joined New York, Ohio and Texas in qualifying for R. F. C. funds for slum clearance and large-scale, low-rent housing projects.

The New Jersey law is unique in that it provides for the incorporation and regulation of public housing corporations as public utilities, and places such corporations under the jurisdiction of the Board of Public Utilities of the state. The Board is given "full power and authority to fix, limit, regulate and adjust, from time to time, the rentals for all such projects," but no maximum average rental may exceed $12.50 per room per month in cities of the first class, or $10.00 per room per month elsewhere in the state. Dividends are limited to 6 per cent (cumulative) per annum.

Another unique feature of the New Jersey law is the method of taxation:

"Every public housing corporation organized hereunder shall be exempt from the payment of all state or local taxes except the necessary fees for the filing of its certificate of incorporation and except a franchise tax of ten per centum of the gross income derived by it from rentals or from any other source or sources, which percentage of gross income shall be collected and paid to the state the same as are other public utility franchise taxes now or hereafter levied on other public utility corporations in this state.

"Said gross income, less the reasonable cost of collecting the same, which cost shall not exceed one-half of one per centum thereof, shall on or before the fifteenth day of January in the succeeding year following its collection, be distributed and paid by the state to the several municipalities in which said housing corporations may be operating, in proportion to the amount of such gross income collected by the state from the housing corporation or corporations operating in such municipalities."

The right of eminent domain is granted under the Act in behalf of public housing corporations through the governing body of the municipality in which the property to be condemned is located whenever the exercise of such power "becomes necessary to promote public health and safety or to provide for the elimination of unsanitary or unsafe structures then used for dwelling purposes in any municipality of this state."

Eight-Million-Dollar Loan for Slum Clearance Project

THE first housing development actually to be constructed through the aid of the R. F. C. will apparently be the so-called Knickerbocker Village project, on the Lower East Side of New York, for which an advance of up to $8,075,000 to the Fred F. French Operators, Inc., was announced on March 3.

Why Not Give Money A Job?

NOT the least advantage of increased public works construction on a nation-wide scale would be the fact that it would give employment not only to men but to money. In this connection an editorial appearing in the current issue of *Nation's Business*, headed "Money Can't Find a Job," is significant:

The visitor from Mars might wonder at many things in this world of ours—at hungry men and grain unthrashed in the fields; at shoeless children and closed shoe factories. He might wonder that in a world that complains of a lack of money there is too much money. At least there is too much money in some places.

A manufacturing corporation had a considerable cash surplus. Its president called the large New York bank where it kept some of its funds and said in effect:

"We've got too much ready money. Where can we put it? Short term government bonds don't pay anything worth while; banks aren't paying enough on deposits to be attractive. What can we do?"

Followed a conference of some length over the long distance telephone with two or three bank officials taking part. And the final outcome was:

"We don't know anything to do with your money except hold on to it."

Six weeks ago another banker said to the writer:

"We are constantly asked: 'Tell me what I can do with my money. I have more on hand than I need. Where can I put it so that it will be safe and profitable.'

"And," said the banker, "all we can tell them is to put it in short term governments and wait to see what happens."

A world of poverty and unemployment with money looking for work.

March R.F.C. Loans for Self-Liquidating Public Works

THE Reconstruction Finance Corporation agreed in March* to purchase bonds for self-liquidating projects in the following amounts:

Southern Merchandise Mart Co., Charlotte, N. C., construction of merchandise mart	$140,000
Coal Grove, Ohio, construction of water system	62,000
Union City, Ind., improvements to water works	45,000
Fort Sumner Irrigation District, De Baca County, N. Mex., extensions to canals, and a new concrete diversion dam	135,000
Williamsburg, Ohio, installation of water system	35,000
North Sterling Irrigation District, Sterling, Colo., enlarging main intake canal	110,000
Illmo, Mo., construction of water-works system	42,000
Pima Water Co., Pima, Ariz., additions and improvements to company's water works	13,500
Owingsville, Ky., construction of water-works system	49,000
Radford, Va., additions to electric power system	129,000
Bethel, Ohio, construction of water works	35,000
Flemingsburg, Ky., construction of water-works system	75,000
Greensburg, Ky., construction of water supply and distribution system	40,000
Marion, Ky., construction of water works	35,000
Sulligent, Lamar County, Ala., construction of water-works system	38,000
Owenton, Ky., construction of water system	65,000
Thomasville, Ala., improvements to water-supply system	20,000
Virginia, Ill., construction of water-supply and distribution system	100,000
Tulsa Union Stockyards, Inc., Tulsa, Okla., construction of stockyards	50,000
Jones Beach State Parkway Authority, New York, improvements to Jones Beach State Park	5,000,000
State Agricultural and Mechanical College, Monticello, Ark., construction of two dormitory buildings	185,000
"Knickerbocker Village slum clearance and housing project, New York	8,075,000
Roseville, Ohio, improvement of water-works	15,500
Richmond, Ky., reconstructing gas distribution system	40,000
Niagara Frontier Bridge Commission, toll bridges over Niagara River	2,800,000

Reporting on its operation since the Emergency Relief and Construction Act became effective last July, the Corporation states that up to March 21 it had agreed to advance $186,395,683.39 to aid in financing construction of self-liquidating projects; $862,784.37 of this had been canceled or withdrawn, $165,850,899.02 remained to the credit of borrowers, and $19,682,000 had been advanced in cash.

* Loans granted by the R.F.C. in February were listed in the March issue of THE AMERICAN CITY, with the exception of a loan of $428,000 to the city of Bloomington, Ind., for the construction of a complete sewage treatment works, including a pumping station and an outfall sewer.

Leading in UNEMPLOYMENT RELIEF

EVEN as Lock Joint Pipe Leads in

Long Life
High Carrying Capacity
Low Operating Cost

SO does Lock Joint Pipe Lead in

Direct Benefits to
Your Community
During Construction

The use of Lock Joint Pipe, manufactured in your own community, assures greater immediate relief for your unemployed and more business for your local merchants.

Instead of being manufactured elsewhere and SHIPPED into your city, as with metal pipes, Lock Joint Concrete Pipe will be MANUFACTURED IN YOUR OWN CITY, employing your local labor and using materials purchased from your local merchants.

Since the cost of manufacturing any pipe is about three times the cost of laying it, the use of Lock Joint Pipe means three times more money to be spent right in your own community, and therefore, three times the benefit to your local taxpayers and customers.

Lock Joint Pipe Co., Ampere, N. J.
PRESSURE: SEWER: CULVERT: SUBAQUEOUS

LOCK JOINT
Reinforced Concrete
PRESSURE PIPE

Has ALWAYS Been GOOD—But It Is BETTER THAN EVER In These Days

Pure Water—Man's Greatest Need

Items on Water Supply and Purification

Completely Automatic Pumping Stations Make Own Reports

THE new Pikesville and Townson pumping stations of the Baltimore, Md., water supply are so completely automatic that it is merely necessary for headquarters to call the unattended stations on the telephone if reports of operating conditions are desired. A unique method of obtaining these automatic reports was designed for the purpose by General Electric engineers and was recently put into operation. The pumping equipment, consisting of two motor-driven pumps, is automatically started and stopped in accordance with the water level in the reservoir. A hand-operated switch in the pumping station makes it possible to predetermine which pumping unit shall start in response to the water-level indication, but should this preferred unit shut down because of trouble or for some other reason, the second unit is automatically started in its place.

By means of special audible indicating equipment, operators at a distance can obtain reports of the conditions in the pumping station from any telephone connected with the station. The pumping station number is dialed in the usual manner, and the indicating equipment is immediately set in action. The desired information is transmitted by means of a series of codes made up of long and short buzzes heard in the telephone receiver. The different codes are separated by a single-stroke bell signal also heard in the telephone receiver.

The first report transmitted by the code tells whether or not conditions generally are satisfactory and correct at the station. In that event, the equipment continues its report, telling which of the two pumping units is selected as the preferred one; whether water is flowing into or out of the reservoir; what the water pressure is in 5-pound steps from 50 to 70 pounds; and what the water level is in the reservoir in 1-foot steps over a 6-foot range. If the first report, however, showed that the station was not in satisfactory operating condition, then an additional set of codes is transmitted, indicating whether or not voltage is available for each of the pumping units, and whether or not either unit is locked out of service because of the functioning of some protective device.

When the audible equipment is once started, it proceeds to report on all the various conditions described and then repeats the code signal as a check. If, however, someone is visiting the pumping station and wishes to answer the telephone, he may do so without interference from the audible indicating equipment, because it is disconnected from the telephone as soon as the receiver is lifted.

The Peru Water Filtration Plant

ON July 31, 1932, the new filtration plant for the Peru, Ind., water works was formally dedicated. The construction of this plant, which has been paid for from earnings of the municipal light and power plant, was started in September, 1931, and it was completed just prior to its formal dedication. The plant is designed for iron removal from well water, or for the use of Wabash River water, and is arranged for future softening of the raw water. Well water is pumped to the plant from a distance of one mile.

The present capacity of the plant is 3 million gallons, with possible future extension to 4½ million gallons. The treatment consists of aeration through two 1½-million-gallon Vogt Aer-O-Mix units with the coagulant fed by International feeders with 30-minute chemical mixing by a Dorrco agitator, followed by settling through two 55-foot square settling basins having four hours total retention period; one of these basins is equipped with a Dorr traction clarifier. The sludge is removed from the basin by a 50-gpm sludge pump.

The filters consist of four 14 x 19-foot gravity sand filters, equipped with International operating tables and with Wagner block underdrains. Provision is made for two additional filters. The filters are hydraulically controlled with Simplex equipment. Dean-Hill pumping equipment with GE motors is used, consisting of one 2,000-gpm and one 1,000-gpm motor-drive and one 1,000-gpm dual-drive pump for high service, with Sterling gasoline engine auxiliary drive and space for future pumps. The wash-water pump is a 4,000-gpm motor-driven unit. The plant is equipped with Republic Flow Meters Co. pressure indicators and recording instruments and a complete laboratory for chemical and bacteriological analysis of the water.

FLOYD L. KERNS,
Manager, Light and Water Department.

A Record in Collecting Water Bills

R. C. MEADERS, Superintendent of Water Works, Dahlonega, Ga., has established what we believe to be a record in the collection of water bills, particularly in these times. He reports that all water bills rendered since the municipal system was installed, in September, 1927, amounting to about 5,000 separate bills, have been collected, except one amounting to $1.50. Thus, in 5½ years there has been a loss of but $1.50 in Water Department revenues. This failure was recorded against a non-resident who remained only 3½ months. In spite of a rather high rate, this fine record has been obtained.

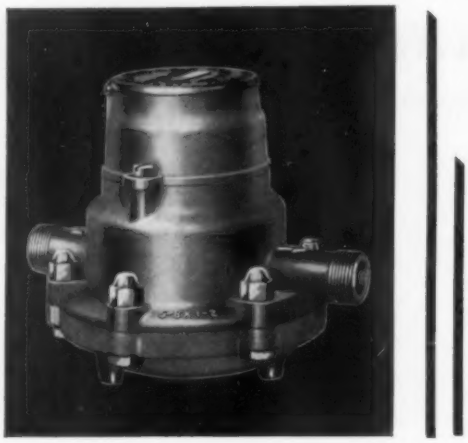
A "Water Fuse" for Hot-Water Plumbing Systems

THE principle of the electric fuse applied to hot-water plumbing systems provides a satisfactory emergency safeguard against steam generation, according to a recent report of the special committee of the Hackensack Water Co., Weehawken, N. J., which is investigating this type of hazard in North Bergen and Hudson Counties, N. J. The "water fuse" contains a metallic or chemical piece that softens at once when a predetermined safe temperature is reached in the hot-water system, either opening a vent for hot water and admitting cold water to the tank, or shutting off the gas supply to the heater.

There has been a distinct need for a simple, inexpensive device which would positively and surely limit the temperature of the water to a predetermined degree of heat, not a thermostat, but an emergency safeguard against steam generation. Thermostat controls are working parts of the automatic heat control in many types of hot-water units. They are generally very reliable, but they are at work day in and day out, and, like other moving parts, are subject to wear and occasional trouble. If one sticks shut, the water is not heated and safety is certain, but if one sticks open, the next line of defense against real danger is usually some form of a safety valve or relief valve operated by excess pressure, often at the steaming point. This is fundamentally unsound, according to the report, for no one wants to make a steam boiler out of a hot-water tank, especially as the outside of a tank tells little or nothing about its interior and strength.

Research has found its answer in the fuse, which now performs a unique service in the household. This form of release is used in several ways. A simple type of universal application opens a vent for the hot water and admits cold water to the system until the householder regulates the heat. Another type coming into wide use among gas companies completely closes the gas supply to the heater, thus treating the emergency at its source. These fusible materials have passed the most rigid tests of the Underwriters Laboratories, and in the latest type of valve are enclosed so as not to be in contact with either gas or water, which is an important factor in preserving their thermal exactness.

Have you sent in your report on water-meters? See reports on page 9 of this issue.



BALANCED DESIGN!

The "Plus" quality in American and Niagara Water Meters

Each part in a water meter must be well designed, finely built, if the meter is to give reasonable service. But an aggregation of fine parts is not enough to assure truly fine performance. It requires something "plus." *Balanced design* is essential!

Just as the well-rounded football team will outplay and defeat a collection of opposing stars who "play to the grandstands," so will perfect team-play of all parts in a water meter give the extra accuracy and added life that you are looking for. This you get in American or Niagara Meters.

Back of every American or Niagara Water Meter you buy today is 40 years' steady development of perfection in each part and in the balance of the whole. You can test for yourself the superior performance of American or Niagara Meters on your next meter order. Write for prices and details.

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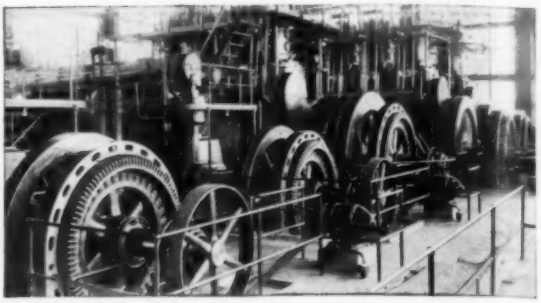
NIAGARA (IRON CASE) and AMERICAN (BRONZE CASE) Water Meters



Five McIntosh & Seymour Diesel Engines operating in St. Petersburg, Florida

FUEL BILLS ARE LOWER

WITH

McINTOSH & SEYMOUR DIESEL ENGINES

DIESEL ENGINES as a class are economical because of the high thermal efficiency. Most prime movers that use fuel convert only from 5 to 18 per cent of the heat into useful work. As compared with this, Diesel Engines regularly convert to work, 30 to 35 per cent of the available heat in the fuel; therefore, the amount of fuel purchased is less.

McIntosh & Seymour Diesel Engines because of their efficient fuel injection system are able to handle inexpensive fuel oil which makes the cost of fuel per horsepower produced very low.

This ability of McIntosh & Seymour Engines to use inexpensive fuel is due to the use of the most modern principles of design backed by over forty-five years' experience as engine builders.

Your power problems will be given careful study by our engineers if you will but ask for their service.

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Water Meters Aid Revenue

Items on Advantages of Meters

Malvern, Ark.

THE water-works plant in Malvern was put into operation on June 15, 1920, when the population was 3,864. Of the services, 25 per cent of the domestic were metered and all of the industrial services. In 1930 the population had increased to 5,115; 75 per cent of the domestic services and 100 per cent of the industrial services were metered and the average daily consumption was 125 gallons per capita. In 1932, with the population the same, and 100 per cent of all services metered, the consumption had dropped to 90 gallons per capita. While no figures are available on the saving through metering only, it is interesting to note that between July, 1930, and July, 1932, by 100 per cent metering and replacing a wooden raw-water line with cast iron the power bills for pumping were cut 50 per cent. It is felt that one-half of this saving was probably due to 100 per cent metering.—D. Y. McDOWELL, Superintendent, Water Department.

Palo Alto, Calif.

THE municipal water works of Palo Alto have been 100 per cent metered for more than 25 years, and records prior to that time are not available, so it is impossible to make definite statements regarding the saving due to metering. In 1910 with a population of 4,486 and 100 per cent metering, the average daily consumption was 56 gallons per capita. In 1920, population 6,600, consumption 71 gallons per capita; 1930, population 14,000, consumption 126 gallons per capita; 1932, population 15,198, consumption 120 gallons per capita. These figures do not include water used by city departments. —J. F. BYXBEE, City Engineer.

Redlands, Calif.

THE water system of Redlands has been 100 per cent metered since 1920, when the population was 9,874 and the average daily consumption 395 gallons per capita. In 1930, when the population was 15,777, the consumption was 257 gallons per capita; in 1932, population 16,812, consumption 310 gallons per capita. All connections throughout the city are metered except sewer-flushing devices, fire plugs and hydrants for street flushing.—GEORGE S. HINCKLEY, City Engineer.

Miami Beach, Fla.

MIAMI BEACH has been 100 per cent metered since 1925, at which time a new supply was used. Previous records are not available. The City Water Department of Miami Beach purchases the water from the Miami Water Co. and retails to the consumers within the city. At the end of the fiscal year 1931-1932 there were 2,393 services. A total of 91 per cent of the water was accounted for, and the average consumption of water per service during the year was 364,000 gallons. The purchase price of water is approximately 14 cents per 1,000 gallons, and the retail price is 25 cents per 1,000 gallons. The cost of water to the city per 1,000 gallons sold, including purchase price plus operating costs, was 19.9 cents, and the revenue per 1,000 gallons sold was 26.2 cents.—H. H. HORN, Superintendent, City Water Department.

Tampa, Fla.

THE population of Tampa, Fla., has remained at approximately 100,000 for 1930 and 1932. In the former year the domestic services were 60 per cent metered, and in the latter year 70 per cent metered. The average daily consumption of water was reduced from 9,500,000 gallons in 1930 to 8,500,000 gallons in 1932, effecting a saving of about $20,000 per year to the Water Department.—J. W. GRANT, JR., Auditor.

Decatur, Ga.

IN 1930, when the population of Decatur, Ga., was 13,616, the domestic services were 96 per cent metered and the industrial services 98.6 per cent metered. In 1932 the population had increased to approximately 14,000, and the domestic services were 98.2 per cent metered and the industrial services 99 per cent metered. The actual saving in the past two years has amounted to about $1,000 in the Water Department. Decatur has always had a majority of the services metered, but in 1930 about 18 per cent of all the meters stopped. An intensive survey has corrected this condition, and now only about 3 per cent of all the meters are not registering. This figure remains practically constant. By correcting this feature the Department now makes a profit of 4 cents per 1,000 gallons after deducting free water used for fire protection.—W. H. WEAVER, City Engineer and Superintendent, Water Department.

Weiser, Idaho

WEISER had a population of 3,500 in 1932 and has been 100 per cent metered since 1912. The average daily consumption per capita is about 100 gallons. The population has remained the same since metering began, but unfortunately no data are available regarding the consumption from 1903 to 1912, which was the period of the operation of the water works under a flat-rate system. —LYLE WOOD, Superintendent, Water Department.

Batavia, Ill.

THE domestic services in Batavia have always been metered 100 per cent. The population has remained practically constant at 5,000 since 1900, and the per capita daily consumption is 92 gallons.—L. A. PARRE, Superintendent, Water Department.

Linton, Ind.

THE population of Linton in 1930 was 5,040. With 50 per cent of the domestic services and 98 per cent of the industrial services metered, the average daily consumption was 468,000. The consumption was the same in 1932 with a population of 5,100 and 75 per cent of the domestic and 98 per cent of the industrial services metered. The replacement of new mains from the field pumps to the reservoirs, together with the additional 25 per cent metering, saved 50,000 kilowatts and energy in pumping. The daily consumption remains the same, the former field leakage being absorbed by the increased population and industrial consumption.—LINTON MUNICIPAL WATER CO.

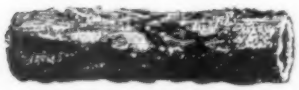
Washington, Ind.

THE city of Washington recently purchased a local water plant, and the following facts are furnished from such old records as are available. In 1900, the population was 8,000 and there were no meters. At that time the daily consumption was 75 gallons per capita. In 1910 the population was still 8,000, the domestic and industrial services were 20 per cent metered and the daily consumption had increased to 100 gallons per capita. In 1920 the population was 9,600, the services were 50 per cent metered and the daily consumption was 104 gallons per capita. In 1930 the population was 10,000, the services were 100 per cent metered and the daily consumption had dropped to 94 gallons per capita. With the same population and the services 100 per cent metered, the daily consumption had decreased 7 gallons, making it 87 gallons per capita in 1932. The consumption data are based on the venturi meter at the pumping station.—A. C. GUTSCH, Superintendent, Water Department.

Cedar Rapids, Iowa

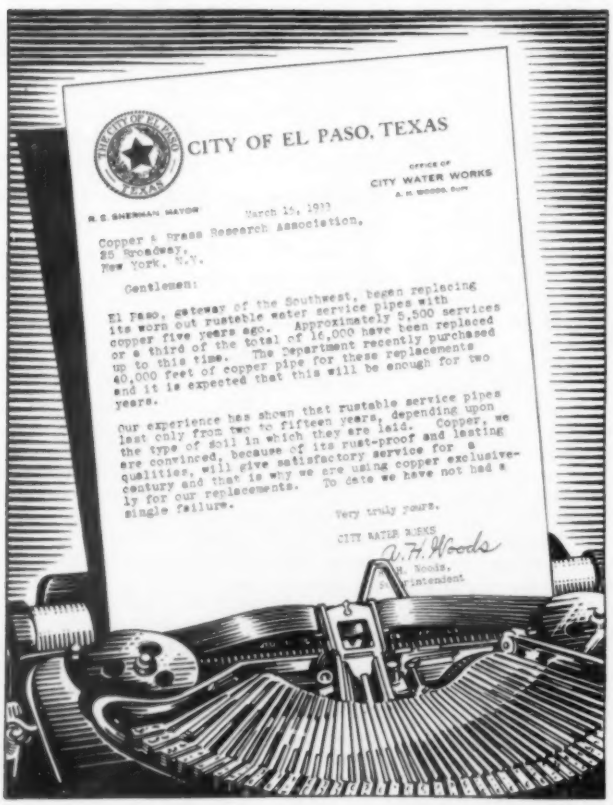
WATER services in Cedar Rapids have been 100 per cent metered since 1910. The population in 1920 was 45,566 and the daily consumption was 71 gallons per capita. The population in 1930 was 56,078 and the per capita consumption 79.1 gallons. In 1932 the population was 57,000 and the per capita consumption 82.3 gallons.—H. L. BLOMQUIST, Superintendent, Water Department.

YOUR 20 FEET OF RUSTING PIPE . . . . . .



can undo the work of

the householder's 150 feet of pipe THAT CAN'T RUST!



CITY OF EL PASO, TEXAS

OFFICE OF
CITY WATER WORKS
A. H. WOODS, Supt.

R. E. SHERMAN, MAYOR

March 14, 1932

Copper & Brass Research Association,
25 Broadway,
New York, N.Y.

Gentlemen:

El Paso, gateway of the Southwest, began replacing its worn out rustable water service pipes with copper five years ago. Approximately 5,500 services or a third of the total of 16,000 have been replaced up to this time. The Department recently purchased 40,000 feet of copper pipe for these replacements and it is expected that this will be enough for two years.

Our experience has shown that rustable service pipes last only from two to fifteen years, depending upon the type of soil in which they are laid. Copper, we are convinced, because of its rust-proof and lasting qualities, will give satisfactory service for a century and that is why we are using copper exclusively for our replacements. To date we have not had a single failure.

Very truly yours,

CITY WATER WORKS
A. H. Woods,
Superintendent

What good will it do the householder to equip his home throughout with brass or copper pipe that can't rust—if a rusty service pipe delivers him a supply of muddy-red water? And what good will it do the water company to have to replace its service pipe every so often because of rust or soil corrosion?

Install service pipe of copper. It doesn't rust. It's affected little or not at all by soil corrosion. It's easy and economical to install because it comes in long lengths or coils.

Flexibility cuts down the number of joints. Copper tubing can be bent around obstructions. No "goosenecks" needed—the tubing is its own "gooseneck." It delivers a full supply of *clean* water.

Hence modern regulations and codes specify copper service tubing. In that connection, the wide experience of this Research Association is at your service. Write for information.

←*FROM EL PASO, TEXAS. Says A. H. Woods, Supt. of Water Works: "Copper, we are convinced . . . will give satisfactory service for a century . . . To date we have not had a single failure."*

Copper SERVICE Tubing

COPPER & BRASS RESEARCH ASSOCIATION 25 Broadway, New York City

Construction and Maintenance

Engineering and Highway Departments

Inspection and Care of Sidewalks

A VERY careful inspection of concrete sidewalks is made in the village of Oak Park, Ill., each year. In 1931, this inspection covered all defective sidewalks, whether they were in dangerous condition or merely defective. The 200 miles of sidewalk inspected showed 29,988 lineal feet to be defective, some of which was in a dangerous condition. A total of 1,989 notices were sent out to property owners to make repairs. In response to these notices 11,327 lineal feet of the dangerous concrete sidewalk was repaired or replaced. This sidewalk was relaid by licensed contractors under village inspection.

Wherever the bad condition of the sidewalk in front of private property was due to parkway trees or occasioned by village work, repairs were made at the expense of the village. About 8,490 lineal feet of sidewalk were repaired at 930 locations at the expense of the village. This amount covered defective sidewalk in front of private property, for which the village was responsible, and repairs of sidewalk aprons at street intersections.

Three sidewalk accidents were reported to the Village Board during 1931 and claims filed against the village for damages in connection therewith. Two of these cases were settled for small amounts and releases given to the village, and one claim required court action.

DUDLEY C. MEYERS,
Commissioner of Public Works.

Dirt Street Maintenance by the Oil Blotter Method

IN the maintenance and oiling of dirt streets in Minneapolis, Minn., the blotter method is used almost entirely. The roadway is scarified by using a Caterpillar Sixty tractor with either a hydraulic scarifier or a combination heavy-duty road machine scarifier, the teeth being set to scarify to a depth of 5 to 6 inches. After the street has been scarified, the tractor and heavy-duty road machine are used to blade the material. Starting in the center of the roadway, the scarified material is windrowed evenly at the gutter lines on both sides of the street. In order to break up all lumps and produce a smooth roadbed and prepare the street for oil, the operation is then reversed and the windrows are leveled toward the center of the street. After this operation, sufficient loose dirt to cover the oil is again moved into the gutters and left there in windrows.

The next operation is the application of the oil. During the last fiscal year the city used approximately 2½ million gallons of oil. There are five oil plants in different sections of the city, thus eliminating long-distance hauling. The combined storage capacity of these five municipal plants amounts to 950,000 gallons. Each plant has a heating tank fitted with heating cells and covered with magnesia blocks to prevent loss of heat, and mounted high enough to permit flow into the oil distributor by gravity. The heating tanks are of 5,700 gallons capacity, which gives an ample supply of hot oil at all times. The temperature of the oil in the heating tank is maintained at about 200 degrees Fahrenheit.

The oiling units consist of eight 3½- to 5-ton trucks with oil distributors mounted on them. The distributors are of 1,100 gallons capacity each. The oil is pumped with a rotary pump connected to the power take-off through a 60-mesh screen to prevent clogging of the sprays. The spray consists of two small oil jets striking each other at about a 45-degree angle and in this manner causing the oil to break up into a mist. The sprays are set at 6-inch centers along the spray bar. The oil pressure may be varied at will by means of adjusting a by-pass valve to the desired pressure, which is indicated on a dial pressure gage located in front of the lever operator. A chart is posted in the truck cab indicating the number of gallons of oil spread per square yard in relation to the pressure carried on the gage and the speed of the truck. A canvas cover is mounted on the spray bar to prevent the wind from carrying away a portion of the fine mist or oil spray, which would not only result in the loss of oil but also cause damage to personal property.

In applying the oil the average spread is about one-seventh of a gallon per square yard and the oil is applied to the entire roadway between the windrows on each side of the street. After the oil has been applied, a pneumatic-tired patrol grader is used to cover the oil. The patrol moves all the dirt left in the windrow at the curb towards the center of the street, leaving another windrow nearer the center of the roadway on the first round. On the second round the patrol grader picks up the windrow from the previous round and feathers it out to the center of the street, in this manner covering all the exposed oil.

When the oil has been covered, a planer attached to a truck or small tractor, or a truck equipped with a spring blade, is used to rake the surface rocks into the gutter, leaving the surface of the street very smooth. The gutters are then cleaned by a hand crew, and when this is finished the shoulders of the roadway are often given a light application of oil. This application is about 5 feet wide and starts at the gutter line. It is not covered nor rolled.

The number of applications and the method used depend upon the traffic and soil conditions. On streets where there is sufficient oil from former applications and additional oil would only have a tendency to cause waving in the streets, the street is scarified and bladed and no additional oil is applied.

On some of the streets an application of oil by the blotter method will keep the road in good condition for a period of two seasons, the only maintenance being patching with a material made at the asphalt plant at a cost of $2.50 per ton, and cleaning and oiling the gutters. There are some streets, however, on which it is necessary to scarify and machine the road two to three times a season. These streets are not numerous and are becoming fewer each year as dirt street arterials are being paved. The street soils consist mostly of sandy loam and humus materials, so it is essential to use a highly viscous oil which will have the necessary binding properties.

The cost of preparing and oiling streets by the method described would average from 1½ cents to 1¾ cents per square yard, or $264 to $308 per mile, for a 30-foot roadway. The machine costs are based on the following rental rates:

	Per Hour
60 horsepower tractor and road machine with operators	$5.00
15-30 patrol grader with operator	2.25
3½-5-ton truck with operators	2.00
Oil distributor with operators	3.50
Truck and planer with operator	3.50

For 1932 the sum of $340,000 was spent for maintenance and dust prevention on dirt streets. This includes all maintenance and cleaning, without office supervision and overhead.

—From a paper by JAMES GARBERG, Superintendent of Streets, Minneapolis, Minn., presented before the International Association of Public Works Officials.

Canada Spends Millions on Roads

THE Dominion of Canada spent $60,002,819 on the construction of highways in 1931, while expenditures on maintenance of roads amounted to $22,287,153, according to a copyright article in the *New York Sun*. At the end of 1931 there were 98,564 miles of provincial highway in the Dominion and 279,518 miles of local roads. Surfaced highways increased from 80,497 miles in 1930 to 85,885 miles in 1931.

The provincial highway debenture outstanding at the end of 1931 was $374,463,000, and the annual charge for interest and sinking-fund was $19,773,000. This was exclusive of county and township debentures for highway purposes.

FINAL
DAILY NEWS
NEW YORK'S PICTURE NEWSPAPER
2 CENTS IN CITY LIMITS
Vol. 14. No. 229 40 Pages
New York, Monday, March 20, 1933
Vohs' car struck a fire hydrant and he was flung through a door to the pavement, fracturing his skull.
WINTER TAKES 3 LIVES. — Winter's last fling killed William Vohs, 26, of 31 Aberdeen St., Brooklyn, yesterday, when this car which he was driving, collided with another at Remsen and Flatlands Aves., Brooklyn. Force of collision drove Vohs' car to sidewalk where it struck the fire hydrant. He was flung through door and instantly killed.

Should fire hydrants be unbreakable?

—*Do you want this to happen in YOUR community?*

THIS "unbreakable" fire hydrant certainly "did its stuff."

When struck by a colliding automobile, the hydrant was merely pushed over—*but repairs will involve expensive excavation, recaulking of the pipe connection, and repaving.*

More than that, this hydrant prevented the driver from escaping —*by catapulting him out of the car to his death.*

The total result—a costly hydrant repair job, property damage of $1,000.00, and the death of an innocent citizen of the community.

Are "unbreakable" fire hydrants worth this price? If the hydrant had been a Kennedy SAFETOP, the smashing impact would simply have parted the patented Safety Breakable Section, protecting the occupant of the colliding vehicle from serious injury, limiting the damage of the automobile, and permitting quick repair of the hydrant at a total cost of less than $10.00.

The Kennedy SAFETOP is the *only* fire hydrant that meets present-day traffic conditions by combining adequate strength, dependability of operation, economy of maintenance, and safety for the community.

Write for full information

The Kennedy Valve Co., Elmira, N. Y.

The Kennedy SAFETOP Fire Hydrant is amply strong to withstand without injury any impact that fire hydrants now commonly used will endure without breaking. In case of a severe smashing impact, however, a standpipe breaking ring and stem coupling break cleanly apart, without injury to upper or lower sections of the standpipe or stem.

An additional advantage of the SAFETOP Hydrant is that the nozzles can be rotated exactly to any desired position without disconnecting any parts or removing bolts.

KENNEDY
SAFETOP Fire Hydrant
Patented

Sewage Treatment Means Clean Streams

SEWERAGE and SEWAGE DISPOSAL

Quantities of Sewage Produced

THE quantities of sewage and their variation have an important influence upon the cost and behavior of sewage disposal works. The quantity of sewage is determined for the most part by the amount of water used and wasted by the people of the community and their industries, by the amount of ground water which leaks into the sewers and, in the case of combined sewers, by the amount of surface run-off taken into the intercepting sewers. The amount of water used and wasted by the community varies during each hour of the day and during each day of the year, and in a general way with business conditions. The quantity of sewage will be increased by greater infiltration during wet seasons as compared with dry seasons. There is a good deal of difference in the resulting rates of flow at different sewage treatment plants.

At Walla Walla, Wash., the relatively high rate of 300 gallons per capita per 24 hours is occasioned by the availability of an abundant supply of water which is used freely, and by the relatively large infiltration into the sewers from a comparatively porous soil. The rate of flow at Decatur, Ill., calculated a few years ago as somewhat over 250 gallons per capita, is lower at the present time because of the business depression and has been reduced by the rainfall of the past year or two. In a general way the yearly average quantity of sewage reflects the per capita use of water and is influenced by the amount of industrial sewage discharged into the sewers or directly into adjacent drainage channels. The yearly average per capita sewage flows range from about 65 to 300 gallons per capita per 24 hours.

The size of intercepting sewers and their cost is influenced by the amount of rainwater run-off for which it is desirable to provide capacity in the intercepting sewers. In estimating this factor, it is helpful to compute the frequency and duration of direct overflow to the stream for various quantities of intercepted flow.

Figures at hand showing the monthly rate of sewage flow at six sewage treatment plants where long-time accurate records have been kept, are of interest. The influence of the business depression on the quantity of sewage is indicated at Decatur. Pasadena, with no major industries, shows a relatively uniform rate of flow. At Elgin, Ill., and Worcester, Mass., there is a tendency toward higher rates of flow in the spring of the year. At Indianapolis the treated flow appears to be adjusted more or less to the needs of the river into which the effluent is discharged, for the amount treated is generally greater during the summer months. At Worcester, Mass., the average monthly rate of flow varies from about 80 to 170 gallons per capita per 24 hours.

The hourly rate of sewage flow varies and is less at night than during the day in places where the time of flow to the treatment plant is short. In large projects, with longer periods of concentration, the hourly variation is less, and sometimes the inflows from tributary sewers are sufficiently far apart to largely compensate for hourly variations. The discharge of industrial sewage is often irregular, with a disturbing effect at the treatment plant. Differences in the hourly rate of flow have been reduced at treatment works and at industries by building storage for the higher rates. Consideration must be given in the design of sewage treatment works to the maximum rates of flow as regards capacity, and to minimum rates of flow as regards velocities and displacement periods.

—From a paper by SAMUEL A. GREELEY, of Pearse, Greeley & Hansen, consulting engineers, Chicago, Ill., read before the International Association of Public Works Officials.

Cleaning Large Sewers

THE ordinary method of removing heavy material from large sewers, 36 inches in diameter and over, is by transmitting the material within the sewer either to shafts excavated to the sewer or to manholes where it is lifted to the surface by a steam shovel or by means of a hoist operated by hand. When the heavy material is removed, the remainder can be washed through the sewer with a fire hose.

In sewers of smaller sizes, that is, less than 36 inches in diameter, fire hose, aided by any cleaning machine such as the Turbine Sewer Cleaning Machine, may be used. Mechanical apparatus of this kind is found most satisfactory on tangents and where there are no abrupt turns or offsets in the sewers. When clogging material occurs on curves and cannot be removed by hose and water, it is usually necessary to open the street and excavate a shaft to the sewer, remove a section of the pipe, and continue with the hose and water from this point. The location of the stoppage in the sewers can best be determined by ordinary sewer rods linked together at the manholes or shafts and pushed through the sewer until the obstruction is reached. The length of the rods being known, the surface measurements can easily be made and the obstruction, as well as its extent, located. In case a sewer is damaged by settlement or otherwise, without surface indications, the rod method of location is applicable and shows the length to be repaired or reconstructed.

The method used in removing the obstruction and making repairs depends upon the size of the sewer and the location and character of the material to be removed. In storm-water sewers and combined sewers of sufficient size to permit entering with wheelbarrows, the most economical method is that of wheeling the material by hand to shafts where it can be lifted by a crane with a clamshell bucket. Should the location be in a business section of a city, it is better to do all the work at night and bridge the shafts so as to carry traffic during the day. In such a location all material should be removed from the site so as to have the streets clear. In cases of complete collapse of the sewer, pumps of sufficient size to handle the ordinary flow should be provided to pump the sewage ahead of the work and return it to the sewer beyond the damaged portion, through catch-basins or manholes. If the street has not caved or settled above the damaged sewer, repairs may be conveniently and economically made by the tunnel method. When this method is used, extreme care in bracing and backfilling is required in order to secure a safe and satisfactory job. If the sewer extends near or under buildings or under railroad tracks, the best material for backfilling over the sewer is either a lean concrete or a fine slag. This material should be mechanically tamped to place or deposited by means of a cement gun. Slag screened to a maximum size of ¼-inch and placed by means of a cement gun will give a solid back-packing without the use of any cement, at a cost of about 50 per cent of the cost of concrete.

—From a paper by I. CHARLES PALMER, Engineer in Charge, Sewer Construction and Design, Pittsburgh, Pa., presented before the International Association of Public Works Officials.

Sewage Screenings Disposal

THE latest all-mechanical method of handling sewage screenings, practiced in England at the new Ipswich sewage works and at other places, is to flush the screenings removed by the rakes to a so-called stereophagus pump which pulverizes the screenings and delivers them as sludge, direct to the sludge digestion tanks, or returns them to the sewage for tank treatment and deposition as settled sludge. This method, entirely mechanical except for hand extraction of large objects, would seem to offer possibilities of a sensible solution of the problem of disposal of obnoxious screenings. In some British seashore towns, all screening is eliminated by the use of pumps equipped with cutters on the impeller shaft, which masticate the sewage before discharge to the sea.

—From a paper by ISAAC S. WALKER, consulting engineer, Philadelphia, Pa., presented before the Pennsylvania Sewage Works Association.

For Municipal Pools

Perchloron

Use this new, highly concentrated powder that contains over 70% available Chlorine. Progressive municipalities find that it is especially adapted for use as a disinfecting solution in swimming pools and water, because it keeps water safe at all times at extremely low cost.

You are always sure of a uniform solution with Perchloron . . . because its stability is unquestioned. Perchloron can be used in any pool . . . regardless of type or size. It requires no technical supervision and is packed in convenient cans . . . one dozen cans to the case.

Chemicals for Industry

CAUSTIC SODA

BLEACHING POWDER

CHLORINE

ACIDS

Est. 1850

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PENNSYLVANIA SALT MFG. CO.

EXECUTIVE OFFICES, WIDENER BLDG., PHILADELPHIA, PENNA.

Branch Sales Offices: New York, Pittsburgh, Chicago, St. Louis, Wyandotte, Mich., and Tacoma, Wash.

Works: Philadelphia and Natrona, Pa.; Wyandotte and Menominee, Mich.; Tacoma, Wash., Tacoma Electrochemical Co.

When you write for that catalog, kindly mention THE AMERICAN CITY

CLARENCE O. MANKER
City Engineer
Sedalia, Mo.
(Appointed 1923)

GEORGE W. ROSEBERRY
County Engr., Sumner Co.
Wellington, Kans.
(Appointed 1928)

FRED J. McNAIR
County Engineer, Lake Co.
Leadville, Colo.
(Elected 1910)

FRANK E. HUNTINGTON
City Engineer
Amsterdam, N. Y.
(Appointed 1924)

AUBERT J. MOWRY
County Engineer, Sheridan Co.
Hoxie, Kans.
(Appointed 1917)

Who's Who in City & County Engineering

One of a Series of Portraits of Engineering Officials, Which Has Appeared Monthly Since April, 1928

NELSON I. RAYMOND
City Engineer
Owosso, Mich.
(Appointed 1927)

E. SANDQUIST
City Engineer
Havre, Mont.
(Appointed 1925)

JOHN H. KIRKWOOD
County Engr., Grays Harbor Co.
Montesano, Wash.
(Appointed 1927)

J. P. FERRILL
City Engineer
Tyler, Texas
(Appointed 1926)

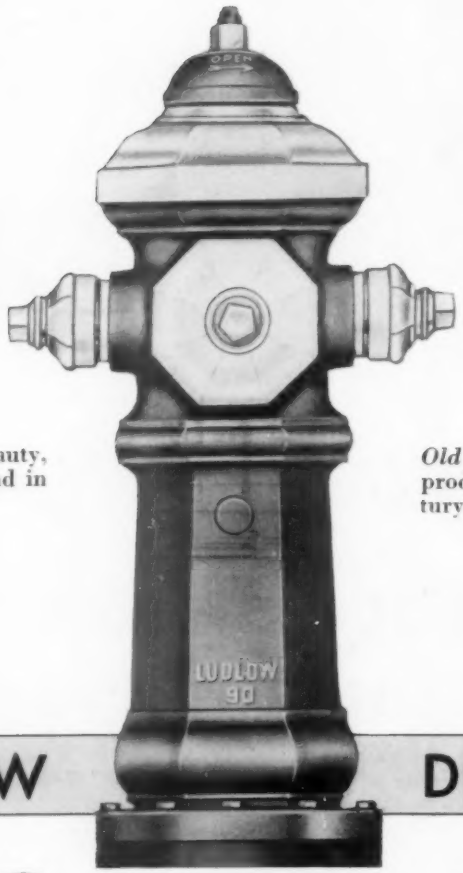
PERRY T. NAYLOR
City Engineer
Hastings, Nebr.
(Appointed 1920)

HARRY J. WIGHT
City Engineer
Knoxville, Tenn.
(Appointed 1928)

H. S. SMELSER
City Engineer
St. Charles, Mo.
(Appointed 1924)

E. R. SMITH
County Engr., Walla Walla Co.
Walla Walla, Wash.
(Appointed 1925)

E. C. GWILLIM
City Engineer
Sheridan, Wyo.
(Appointed 1919)



New as Tomorrow in Beauty, Installation Simplicity, and in Mechanical Design.

Old in Tested Quality—the product of two-thirds of a century's experience.

The LUDLOW DIAMOND

Proof that PROVES

Specify Ludlow Double Gate Valves. Available in Iron, Bronze or Steel up to 78″. Prompt deliveries from stock. 8,000,000 Ludlow Valves and Hydrants now in use.

The Ludlow Diamond Fire Hydrant is less than two years old. Already it has been adopted in over 100 cities in 26 different states.

Residential building has been at such a standstill the last two years that water works extension has been reduced to an absolute minimum. Hence for so many cities—scattered all over the country—to "go Ludlow" is proof that the Ludlow Diamond is more than just a new Hydrant. It has definite points of superiority which any city—your city—will quickly recognize. Why not investigate this matter now?

TRADE LUDLOW MARK

PRODUCTS

Fire Hydrants Double and Single Gate Valves
Air, Check and Foot Valves Sluice Gates
Power Operated Valves

The LUDLOW VALVE MFG. COMPANY

TROY · · · · NEW YORK

METHODS and COSTS of REFUSE COLLECTION and DISPOSAL

Bergenfield, N. J.

The town of Bergenfield, population 8,816, awards a contract to an individual for the collection of garbage throughout the corporate limits. The contractor uses 3-ton motor trucks and disposes of the garbage by burial and covering with not less than 8 inches of ashes or dirt, and disinfecting.—CHARLES HURLEBAUS, Borough Inspector.

Elizabeth, N. J.

A contract is awarded by the city of Elizabeth, population 114,589, for the collection of the garbage. The contractor uses eight 5-ton motor trucks and disposes of the garbage by filling in low land.—GEORGE F. CUMMINGS, Clerk, Board of Public Works.

Englewood, N. J.

Three collections of garbage are made from houses each week, and collections from the stores every day, by the city of Englewood, population 17,805. There is no limit to the amount of garbage which the city will remove. There is a total of 4,300 families served and 230 stores. The appropriation is $47,000 per year. There are two men on each of the eight 2-ton trucks, which carry a 5-cubic-yard open body, which is covered with tarpaulin as the load is completed.—JOSEPH B. DAILY, Superintendent of Public Works.

Fairview, N. J.

Garbage throughout the borough of Fairview, population 9,067, is collected by borough forces using one 2½-ton truck. The garbage is disposed of by dumping on the marshes nearby and covering with ashes.—GEORGE EBEL, JR., Borough Clerk.

Guttenberg, N. J.

A single contract is awarded by the city of Guttenberg, population 6,535, for the collection of garbage. The contractor uses one 5-ton, 5-yard motor truck and disposes of the garbage by dumping in a swamp 2 miles out of town.—PETER HEINZ, JR., Town Clerk.

Jersey City, N. J.

The city of Jersey City, population 316,715, awards a contract for the collection of garbage. The contractor uses fifty-five wagons and ten 8-yard trucks. The contract price for the calendar year 1932 was $440,000. The garbage is disposed of by filling in meadow land west of the city.—ANDREW J. BOYLE, Inspector.

Morristown, N. J.

A single contractor paid by the city collects all the garbage in Morristown, population 15,197, using two 2½-ton motor trucks all of the time and holding two in reserve. The garbage is disposed of by hauling to farms in the country.—E. THEOLA GRIFFITH, Clerk, Board of Health.

Newark, N. J.

The city of Newark, population 442,337, collects the garbage of the city with thirteen 5-cubic-yard wagons and eight 8-cubic-yard motor trucks. The garbage is disposed of by feeding to hogs.—GOLINE DOREMUS, Deputy Chief Engineer, Department of Public Affairs.

Red Bank, N. J.

The city of Red Bank, population 11,622, collects the garbage with three 1½-ton motor trucks with utility bodies. The garbage is disposed of in the municipal incinerator.—A. E. SHINN, City Clerk.

Roselle Park, N. J.

In the borough of Roselle Park, population 8,969, all garbage collection is handled by the borough, using one 1½-ton Ford truck with reinforced springs and a 7-cubic-yard body. The garbage is disposed of in a Nye incinerator.—O. C. PAULSON, Chairman, Borough Council.

Rutherford, N. J.

Municipal collection of garbage is in force in the borough of Rutherford, population 14,915. The borough uses four close body 4-ton motor trucks with 10-cubic-yard bodies. The garbage is disposed of by spreading on a dump and covering with dirt.—F. HACKENBURG, Superintendent of Public Works.

Raton, N. Mex.

A contractor, paid by the individual householder, collects the garbage in Raton, population 6,090, using two motor trucks of 1½- and 2-ton capacity with 5 x 12 and 6 x 10 bodies. The garbage is disposed of by dumping in arroyos and burning when dry. An interesting system has been used for 11 years in billing the individual householder for the collection of garbage. A 1-cent Government postcard is mailed to the householder on the first of each month. The card carries all the information necessary and has worked successfully. The card is reproduced below.—E. M. DRAKE, City Contractor, City Cleaning Department.

Auburn, N. Y.

The city of Auburn, population 36,652, awards a single annual contract for the collection of garbage throughout the city. The present contractor uses four 1½-ton trucks with 3-yard bodies. The garbage is disposed of by burial, using the trench and cover method.—J. J. TEHAN, City Engineer.

Elmira, N. Y.

Garbage collection in Elmira, population 47,397, is made by the city with four 1½-ton trucks, three of 3-yard and one of 4-yard capacity. Combustibles are collected with one 1½-ton stake-body truck 9 feet 6 inches x 6 feet 6 inches x 5 inches, and one 1-ton truck of garbage type of 2-yard capacity. All trucks are hand-hoist, rear-dump bodies. The garbage is disposed of by incineration.—F. J. SULLIVAN, Superintendent, Disposal Department.

Bluefield, W. Va.

One 2-yard wagon and two 2-yard motor trucks are used by the city of Bluefield, population 19,339, for the collection of garbage. All garbage and rubbish is disposed of on the city dump.—KYLE BRUCE, City Engineer.

Not Responsible for Service Complaint After Current Month

Present This Card to Be Receipted. **Enclose This Card When Mailing Check.**

TO E. M. DRAKE DR. **Phone 567**
Municipal Building

FOR GARBAGE SERVICE FOR SEPTEMBER

BRING THIS CARD

Duplicate Bill Will Not Be Issued.

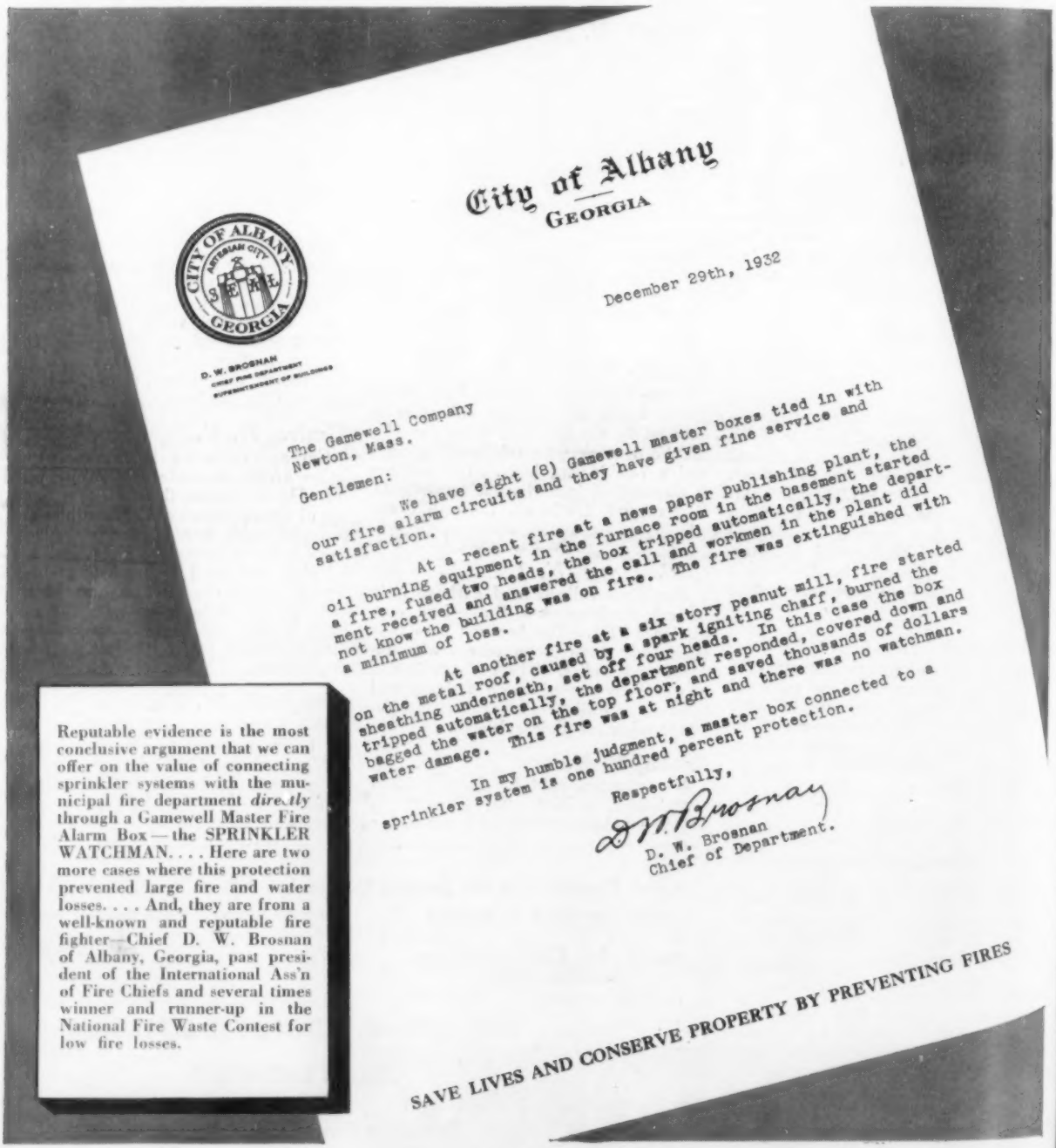
READ THIS

Bills are due on the first and payable at the Electric Light office to our Collector on or before the tenth inst. or SERVICE WILL BE DISCONTINUED WITHOUT FURTHER NOTICE.

REPRODUCTION OF THE BACK OF THE POST-CARD BILL USED BY THE GARBAGE COLLECTION CONTRACTOR IN RATON, N. MEX.

INSTANT ALARM!

***Chief Brosnan cites 2 more cases proving the value of* CONNECTING SPRINKLER SYSTEMS TO MASTER FIRE ALARM BOXES . . .**



City of Albany
GEORGIA

December 29th, 1932

D. W. BROSNAN
CHIEF FIRE DEPARTMENT
SUPERINTENDENT OF BUILDINGS

The Gamewell Company
Newton, Mass.

Gentlemen:

We have eight (8) Gamewell master boxes tied in with our fire alarm circuits and they have given fine service and satisfaction.

At a recent fire at a news paper publishing plant, the oil burning equipment in the furnace room in the basement started a fire, fused two heads, the box tripped automatically, the department received and answered the call and workmen in the plant did not know the building was on fire. The fire was extinguished with a minimum of loss.

At another fire at a six story peanut mill, fire started on the metal roof, caused by a spark igniting chaff, burned the sheathing underneath, set off four heads. In this case the box tripped automatically, the department responded, covered down and bagged the water on the top floor, and saved thousands of dollars water damage. This fire was at night and there was no watchman.

In my humble judgment, a master box connected to a sprinkler system is one hundred percent protection.

Respectfully,

D. W. Brosnan
Chief of Department.

Reputable evidence is the most conclusive argument that we can offer on the value of connecting sprinkler systems with the municipal fire department *directly* through a Gamewell Master Fire Alarm Box—the SPRINKLER WATCHMAN. . . . Here are two more cases where this protection prevented large fire and water losses. . . . And, they are from a well-known and reputable fire fighter—Chief D. W. Brosnan of Albany, Georgia, past president of the International Ass'n of Fire Chiefs and several times winner and runner-up in the National Fire Waste Contest for low fire losses.

SAVE LIVES AND CONSERVE PROPERTY BY PREVENTING FIRES

THE GAMEWELL COMPANY
NEWTON, MASSACHUSETTS

Fire—Police—Safety Items

of Interest to Departments of Public Safety

Adequate Foot Patrol and Intelligent Penal Treatment

THE wisest aim of a police department at any time, but particularly during the present times of stress, is to prevent the commission of crimes and the making of habitual criminals. This is social economy of the highest order, and incidentally reflects itself in the city's finances. There are two times in the career of an actual or a potential criminal where this policy can come especially into play—before an illegal act occurs, and after conviction for actual crimes. The function of the police in the first instance is twofold, consisting partly of crime prevention activities along the lines of social welfare—diverting juveniles from criminal-producing environments and activities into wholesome forms of recreation and organization; and through the time-honored activities of the foot patrolman, the indispensable backbone of the force, whose intimate knowledge of his beat, and vigilance in minimizing temptations for law-breaking—assisted by an effective police signaling system—combine to reduce opportunities for crime.

The other form of social economy is concerned with the treatment of a criminal after conviction. That is the joint responsibility of the court, the criminologist and the parole and probation agencies. Professor Andrew A. Bruce, of the Northwestern University Law School, has ably pointed out the possibilities in both of these directions in a "guest editorial" in the Chicago *Daily News* of February 22, from which the following is taken:

"Crime must be punished and a certain measure of imprisonment will perhaps always be necessary. We should, however, be willing to face the facts and we should reduce the social cost and the social loss as much as possible. We should certainly limit, as far as is possible, our terms of actual incarceration and we should make use of and perfect our agencies of parole and probation. We should do our best to preserve the status of the convict as a father and as a producer. At any rate we must not, when sentencing men to long terms of imprisonment, think that the whole matter ends there and shut our eyes to the red ink on our social balance sheets." . . .

"Perhaps it might be well for us to study the penal practices of England and of Germany, where the sentences are much shorter than they are here. We should do this not only on grounds of humanity, but of public economy.

"More and more we should seek out and eradicate the causes of crime. We also may suggest that in 1928 England spent seven times as much money on its police forces as it did on its prisons. As a rule, here in America, and especially in Chicago, our police forces are so inadequate that they can be used merely as arresters and detectives after the crime is committed and the genus patrolman is rapidly becoming extinct. We forget the fact that the patrolman on his beat can scotch many a criminal snake and break up many a criminal gang."

Fire Training in New York State

TRAINING facilities for the firemen of the cities and villages of New York State were again provided in 1932 under the direction of the New York State Conference of Mayors and the New York State Association of Fire Chiefs. The regional plan of training established by these two organizations in 1929, with some variations, was carried out. The 18 municipalities having adequate training towers were zone centers.

The attendance at the 18 municipal training schools exceeded that of last year, with a total of 3,435 firemen from 53 municipalities. These schools give instruction to the firemen of 21 cities and 32 villages.

Fire Drills by Floodlight

THIS column last month quoted the recommendation of Chief W. H. Palmer, of Charlotte, N. C., that the fire department be equipped with a floodlighting truck to aid in fighting fires at night. Several cities have such trucks, Beaumont, Texas, being one. It can also be used for drills at night, as shown below.

BEAUMONT, TEXAS, DRILL TOWER AT NIGHT

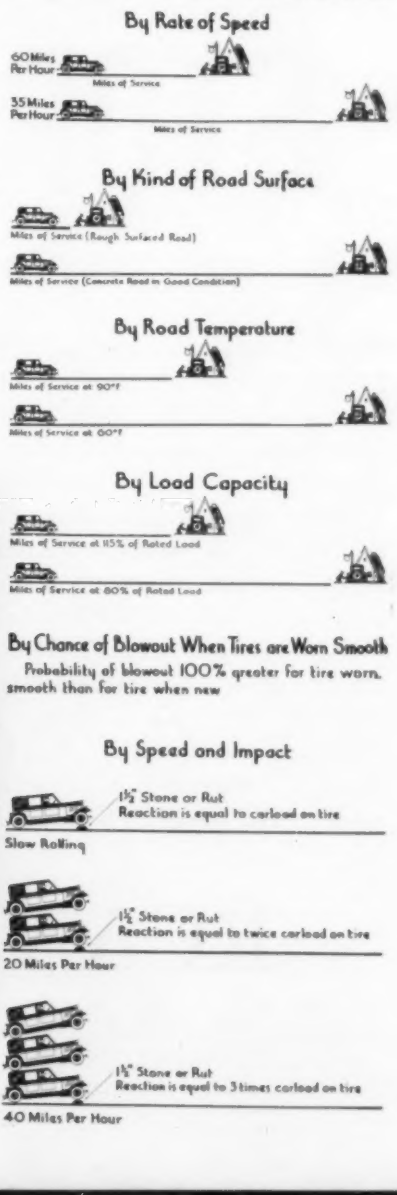
Night drills are made possible by means of the Fire Department's floodlighting truck, equipped with six Crouse-Hinds floodlights supplied with current from an 11.5-kw. Westinghouse generator driven by a gasoline engine

Traffic Accidents

ANOTHER of its valuable booklets on traffic safety has recently been issued by The Travelers Insurance Co., of Hartford, Conn. This one is entitled, "They Call Us Civilized," and makes a pointed comparison of the ruthless ways of savagery, barbarism and superstition, and the ravages of war, with the ghastly toll of traffic accidents today.

One unusual study, made with the aid of the B. F. Goodrich Rubber Co., brought out the relation of the condition of tires to safety, as shown below.

HOW TIRE SAFETY IS AFFECTED


By Rate of Speed
60 Miles Per Hour
Miles of Service
35 Miles Per Hour
Miles of Service
By Kind of Road Surface
Miles of Service (Rough Surfaced Road)
Miles of Service (Concrete Road in Good Condition)
By Road Temperature
Miles of Service at 90°F
Miles of Service at 60°F
By Load Capacity
Miles of Service at 115% of Rated Load
Miles of Service at 80% of Rated Load
By Chance of Blowout When Tires are Worn Smooth
Probability of blowout 100% greater for tire worn smooth than for tire when new
By Speed and Impact
½" Stone or Rut
Reaction is equal to carload on tire
Slow Rolling
½" Stone or Rut
Reaction is equal to twice carload on tire
20 Miles Per Hour
½" Stone or Rut
Reaction is equal to 3 times carload on tire
40 Miles Per Hour

STOP banditry in this city

The sure way to cut down crime—POLICE RADIO

Today there is a speedy and reliable means for halting crime waves. Stop robberies. Chase thugs from your city. Use radio to broadcast police alarms. Spread a net over the entire city instantly, from which criminals cannot escape!

Many large cities are doing it. It has proved highly effective. With police officers in cruising and squad cars, the radio alarm system directs them to the scene of a crime immediately.

RCA Victor engineers have made this apparatus as easy to operate as a telephone. The receivers for the cars are contained in one small unit, easily mounted. They are shock-absorbing and built to stand up under hard usage. They require no special skill to operate. The sensitivity is sufficient to reach the average noise level in any location. The apparatus is completely shielded throughout.

This RCA Victor system costs very little to operate, as it can be kept in a "stand-by" position with a minimum of power drain, and is instantly available when required. The installation and operating cost is far less than the cost of providing enough patrolmen to protect the same area without the use of radio. If you are interested in protecting your city more efficiently, write our nearest office for material which describes the finest police alarm broadcast system that is available for your purpose.

Engineering Products Division

RCA Victor Company, Inc.

A Radio Corporation of America Subsidiary

CAMDEN, N. J. "Radio Headquarters"

THE AMERICAN CITY should always be mentioned when writing for this material which is furnished free.

SEE WHAT'S NEW... STUDY CATALOGS

Keep your files up to date by checking over these items each month and writing for those you need.

AUTOMATIC TRAFFIC WHISTLE

333. Literature may be secured from the Duers Signal Co., Inc., Glens Falls, N. Y., on an automatic whistle to be attached to your present traffic lights, which blows a clear, sharp blast on a regulation police whistle when the light changes, thus greatly stimulating traffic movement at congested intersections and affording a notable advance in automatic traffic control.

CLEANING WATER MAINS CUTS WATER DEPARTMENT COSTS

334. Cleaning water mains cuts water department costs, according to a wealth of data gathered by the National Water Main Cleaning Co., 50 Church St., New York. On jobs for the New Rochelle Water Co. and in Cambridge, Mass., Troy, N. Y., and many other places, economies were effected. All these jobs and many others were supervised by superintendents of the National Water Main Cleaning Co., which will be glad to send further particulars regarding the National Method of water-main cleaning.

FLUTED STEEL LIGHTING STANDARDS

335. Bulletin No. 55 issued by the Philadelphia Electrical & Mfg. Co., 1228-36 N. 31st St., Philadelphia, Pa., describes the new Steelprest lighting standards, which are made in one piece with the base plate welded to the standard and held to the foundation by two bolts. These standards are particularly economical in price and light in weight, though no strength has been sacrificed.

A TRAFFIC LANE MARKING MACHINE

336. A new traffic lane marking machine which makes use of a paint sprayer operated pneumatically is manufactured by Spraco, Inc., 114 Central St., Somerville, Mass.. The width of the traffic line is controlled by the adjustment of two discs giving width from 3 to 10 inches. Complete information may be secured from the manufacturer.

A GUARD-RAIL WITH EFFICIENT DEFLECTION

337. The Empire guard-rail, which bases its efficiency on longitudinal movement of the rail, together with the resiliency of the entire structure and which gives progressive deceleration of impact, is described in detail in literature which may be secured from the General Wheelbarrow Co., 3140 E. 65th St., Cleveland, Ohio.

WELDING FITTINGS FOR PIPE CONNECTIONS

338. Bonney Weldolets and Tredolets for new construction or maintenance work, which are designed to overcome every disadvantage of pipe intersection and which reduce the number of welds, reduce turbulence and friction to a minimum, give clean joints and do away with complicated cutting or forming of the main pipe and branches, are described in folder WT19 issued by the Bonney Forge & Tool Works, Forge Fittings Division, Allentown, Pa.

STEEL HIGHWAY POSTS

339. Something new in highway posts of special analysis iron in a triangular cross-section complete with cap assembly is described in literature which may be secured from The Youngstown Pressed Steel Co., University Road, Warren, Ohio.

A CHIP AND STONE SPREADER

340. Bulletin No. 32 issued by Hercules Products, Inc., Evansville, Ind., describes the Hercules-Ditwiler Universal spreader for road construction and maintenance. It is used for applying surface material to macadam for seal coats, and applying calcium chloride for curing concrete, for dust prevention and for treating ice on highways.

A STREET-SWEEPING ATTACHMENT FOR TRUCKS

341. The Willett Mfg. Co., Grand Rapids, Mich., has announced a self-contained sweeping attachment for mounting on the front end of light-duty trucks which has couplings to permit synchronized steering with the truck and hydraulic control of the broom. Literature and complete details will be furnished upon application to the manufacturer.

RECLAIMING CRANKCASE OIL PAYS

342. Skinner Motors, Inc., 2231 Dalzelle St., Detroit, Mich., will send its literature on the Skinner oil reclaimer, which is built in three models, and which is a real economic unit for municipal and county governments and contractors with fleets of ten or more trucks.

ROLLER-BEARING ROCK CRUSHERS

343. Monco roller-bearing rock crushers in two sizes, 10 x 28½ inches and 10 x 40 inches, which are designed and constructed to produce the smaller grades of crushed rock in large quantities and at the lowest cost per ton, are described in Bulletin M-1½ issued by the Monarch Mfg. Co., Inc., E. Front St., Wilmington, Del.

NEW FEATURES OF HIGHWAY GUARD-RAIL

344. The new features in the design of the Tuthill highway guard-rail, which is built for ease in erection and to give maximum service with minimum maintenance expense, are described in Bulletin HG2 which the Tuthill Spring Co., 760 Polk St., Chicago, Ill., will be glad to send on request.

A SCREW-FEED PRIMARY SLUDGE PUMP

345. Bulletin 128-D published by the Chicago Pump Co., 2318 Wolfram St., Chicago, Ill., describes in detail the new Chicago screw-feed primary sludge pump of the centrifugal type which is built for sewage treatment plants and which will handle rags, heavy sacks, rope and other stringy materials as readily as material of a semi-solid character.

PUMP FEED FOR HEAVY CHEMICALS

346. Proportioneers, 77th and Avalon Ave., Chicago, Ill., will be pleased to send copies of its bulletin on the Ferr-O-Feeder for applying ferric chloride to sludge, and similar devices for applying chemical solutions to water treatment for chlorination or the application of alum or soda ash, to any municipal officials.

AN ECONOMICAL WAY TO PREVENT ACCIDENTS

347. The Cleveland trench guard, consisting of a pair of swiveling guard-rail holders of rust-proof malleable iron, galvanized pipe supports and a flag or lantern support which makes the danger signal visible from all directions, is described in an illustrated folder recently issued by the Cleveland Trencher Co., 20100 St. Clair Ave., Cleveland, Ohio.

A NEW 28-HP TRACK TRACTOR

348. The Model M tractor, which follows the general design of the Model 35 and Model L and weighs 6,200 pounds, has track shoes 12 inches in width, and has four speeds forward and many other points of superiority, is described in the latest bulletin and specifications which may be secured from the Allis-Chalmers Mfg. Co., Tractor Division, Milwaukee, Wis.

AN ADJUSTABLE LEVELING HONE

349. The Perry adjustable leveling hone, which is a double-purpose tool for use on maintenance work to plane out ruts and chuckholes and also to spread road-mix material to any desired thickness, is described in a portfolio issued by the Perry Equipment Co., Sidney, O.

A STREET SWEEPER AND SNOW BRUSH

350. The Detroit street sweeper and snow brush, which is adaptable for use with the four-speed transmission Ford truck, making an efficient, practical and economical unit for general street-cleaning work, and which will sweep light snow or dirt on streets to the speed of 10 miles per hour and sweep a clean path 5½ feet wide, is described in detail in the illustrated literature of the Detroit Harvester Co., 5450 W. Jefferson Ave., Detroit, Mich.

A DISTINCTIVE TRAFFIC GUARD

351. Page traffic tape contains the same number and same size of wires as used in a standard ¾-inch cable but, as the wires are spread to produce better visibility and higher tensile strength due to the elimination of helical twist, numerous advantages are apparent. A full description of Page traffic tape is found in the 8-page Bulletin DH-756 issued by the Page Steel and Wire Co., Monessen, Pa.

A LINE OF DIESEL-POWERED TRUCKS

352. Sterling Motor Truck Co., Milwaukee, Wis., will be glad to send to those interested complete information on its new line of diesel-powered trucks, which range in capacity from 4 tons upwards and are designed for all types of road building, excavation work, hauling and transportation.

A BUCKET LOADER WITH AN IMPROVED FEEDING DEVICE

353. Complete information in regard to the improved feeding device for Haiss bucket loaders, which consists of renewable and reversible tips for the paddles, may be secured by those interested, from the Geo. Haiss Mfg. Co., 142nd St. and Park Ave., New York.

AERIAL SURVEYS AND MAPS

354. Complete aerial photography in all its phases, including surveys and maps for city planning, zoning, water supply and other studies, constitutes the work of the Airmap Corp of America, Sperry Bldg., Brooklyn, N. Y. Complete information on aerial tax map service will be sent on request.

FEATURES OF CRAWLER TRACTOR CONSTRUCTION

355. The Cleveland Tractor Co., Cleveland, Ohio, has published a 56-page booklet, No. 362, which is well illustrated and indexed, describing the features and construction of Cletrac crawler tractors, both standard and special models

If instead of writing direct to the manufacturer for these catalogs you prefer to send a list of the numbers you desire, to THE AMERICAN CITY, we will secure them for you.

All I do is turn the Hand-Wheel!

"Simple? Say—this Littleford Distributor is easier to operate than a radio! D'you see this control wheel over here to my left? Why, all I have to do is turn it from circulate to spray **and we're applying material!** And when I stop, it cuts off, clean—no stringing out or dripping!

"We filled up at the tank car and on the way out had the low-pressure burner operating—bitumen is all heated and ready to be applied! And believe me, you can't do that with every distributor—I've tried it. Take a look at the thermometer—we're all set, ready to go. Not a minute lost!"

Compare operation and construction of the Littleford Pressure Distributor with others. Write for Littleford Distributor Catalog H-14.

LITTLEFORD
Road Maintenance Equipment
SINCE 1900
LITTLEFORD BROS., 500 E. PEARL ST. CINCINNATI, O.

See What's New Study Catalogs

(*Continued from page* 21)

A UTILITY SPRAY TANK

356. LB utility spray tank No. 101, which is made in capacities from 600 to 1,200 gallons and which is particularly useful for patching, widening curbs, relocating turns, etc., and may be extensively used for surface treatment and shoulder work, is described in the literature of Littleford Bros., 500 E. Pearl St., Cincinnati, Ohio.

A SELF-PROPELLED HIGHWAY MOWER

357. The Centaur Hi-Way mower, a specialized power tool which is a flexible, close-coupled, durable one-man outfit that will cut 30 degrees up or down the slope, is described in illustrated literature which may be secured from the Centaur Tractor Corp., Greenwich, Ohio.

POWER-LINE CONSTRUCTION CREW DEVICES

358. Seeger labor-saving devices for power line construction crews and maintenance men, offering light, fast, safe and efficient equipment, are described in an 8-page illustrated booklet which may be secured on request from The Seeger Device Co., 2115 Smead Avenue, Toledo, Ohio.

A MOWER SHARPENER WITH ATTACHMENTS

359. The New Peerless Jr. mower sharpener announced by Fate-Root-Heath Co., Plymouth, Ohio, grinds reel knives, laps-in reel knives, grinds straight blades, grass shears, hedge shears, sickles, scythes, axes and other edge tools. It is described in detail in the literature that may be secured from the manufacturer.

CLEARING ROADS WITH A ROTARY SNOW-PLOW

360. Edward Zaremba, Snow Pumps, Buffalo, N. Y., has issued an 8-page illustrated folder describing the Zaremba snow pump for completely removing snow from the traveled way of roads and throwing it into adjacent fields.

WATERPROOFING OLD CONCRETE WALLS

361. The use of Stonite for the waterproofing or damp-proofing of concrete walls that have been erected and through defects of construction, or by expansion and contraction, have open cracks or porous places permitting water or dampness to run or seep through the wall, is discussed in detail in folders which may be secured from the Stonhard Co., 401 N. Broad St., Philadelphia, Pa.

SHEET COPPER IN THE CONSTRUCTION OF BUILDINGS

362. A 129-page handbook on sheet copper, superseding previous editions of "Copper Roofing and Copper Flashing," has been issued by the Copper and Brass Research Assn., 25 Broadway, New York, for distribution to municipal officials and architects. This book not only contains revisions and rearrangements of all the important details of sheet copper application in building construction, but also has many new data obtained through research and from the practical experience of leading authorities.

COPPER TUBING AND FITTINGS FOR WATER SERVICES

363. Six reasons why Dieform compression fittings and copper tubing are ideal for water service are given in a folder issued by the Bailey Meter Co., 1050 Ivanhoe Road, Cleveland, Ohio.

AN ACCURATE DEVICE FOR FEEDING WATER-WORKS CHEMICAL SOLUTIONS

364. Phipps & Bird, Inc., 240 Virginia St., Richmond, Va., will be pleased to send engineering data on the Phipps & Bird solution feeder, which has an accuracy of 1 per cent plus or minus and is built in two types, one for automatic continuous operation and one for intermittent operation with supervision.

BASKET GRATE STEEL WATER-JACKETED INCINERATORS

365. In a new 24-page illustrated pamphlet entitled "Decarie Basket Grate Incinerators" the Decarie Incinerator Corp., 155 E. 44th St., New York, discusses municipal refuse incineration, the Decarie basket grate principle, the steel water-jacketed furnace, the refractory lined furnace, and the new Decarie sewage screenings furnace, as well as showing photographs and sections of a large number of Decarie plants.

REFLECTING SAFETY ZONE MARKERS

366. Copalite safety zone markers, which are made in one unit covering the entire width of the safety zone, which are fastened to the street with three lag screws and long shields and carry five reflectors of selenium glass that reflect automobile headlights for a distance of 300 feet, are described in the literature of the Copalite Reflecting Signal Co., Ltd., Phelan Bldg., San Francisco, Calif.

ELECTRIC-WELD PIPE FOR WATER WELLS

367. The advantages of Republic electric-weld drive pipe and casing for water wells, which drives-in hard formations without cracking at the seams, without breaking at the joints and without collapsing in the hole and causing loss of pipe, tools, time and money, is described in the latest literature. Form 217-B, issued by the Republic Steel Corp., Youngstown, Ohio.

See What's New
Study Catalogs

A NEW GAS ROLLER WITH 6-CYLINDER MOTOR

368. Catalog No. 150 recently issued by The Galion Iron Works & Mfg. Co., Galion, Ohio, describes in detail the new Galion Chief, a 3-wheel roller with hydraulic steering, powered by a 6-cylinder motor and equipped with a differential lock which permits locking both rear wheels to prevent slippage.

MUNICIPAL SANITATION EQUIPMENT

369. Highway Trailer Co., Edgerton, Wis., will be pleased to send its series of bulletins on the new highway drop-frame side-dump semi-trailer for the collection of garbage, its bulletin on the savings effected in Peoria, Ill., through garbage collection with Highway trailers, and other information, to municipal officials interested in economics in essential public works departments.

A GANG MOWER FOR PARKS

370. Bulletin No. 6 published by the Worthington Mower Co., Stroudsburg, Pa., describes the Worthington Parkover mower, a gang mower with a small rubber-tired tractor unit to haul it, in which the mowers can be raised 10 inches from the ground for rapid traveling and clearing obstructions.

A MODERN BRIDGE FLOOR SYSTEM

371. Truscon Teegrid floor system, a modern system which develops a capacity for extremely heavy loads and at the same time increases the dead load by an inconsiderable amount, and which is particularly adaptable to bridge floors, involving the use of steel structural tees placed side by side, blocked with triangular crossbars, and the whole filled with concrete, is described in a booklet which may be secured direct from the Truscon Steel Co., Youngstown, Ohio.

A PUGMILL TYPE COLD PATCH MIXER

372. Chain Belt Co., Milwaukee, Wis., has recently issued Bulletin 229 on the Rex pugmill type cold patch mixer, which will handle up to 2½-inch aggregate, and has a capacity of 4 to 6 cubic feet of mixed material, using either emulsified asphalt or cut-back asphalt. The machine is equipped with replaceable liners and an 8-horsepower engine.

EXPANSION JOINTS PRODUCE BETTER PAVING

373. Carey "sandwich" expansion joints, which protect concrete paving against expansion and contraction stresses and which have been proved by 20 years' use in highways and sidewalks in all parts of the world, are described in the 1933 catalog and price list of The Philip Cary Co., Dept. E-1, Lockland, Cincinnati, Ohio.

AUTOMATIC PRESSURE CONTROL VALVES

374. Ross Valve Mfg. Co., Inc., Archibald St., Troy, N. Y., which has produced water-works valves and control equipment that has been standard for fifty years, wil be pleased to send literature covering Ross automatic pressure control valves, feed water filters, portable fire hydrants, hydraulic engines and hydraulic booster pumps.

PULVERIZED PETROLEUM ASPHALT FOR ROAD CONSTRUCTION

375. Lincoln-Ite, a pulverized petroleum asphalt which improves any oiled road surface and which aids the quick drying of oily roads, is described in detail in an illustrated booklet published by the Asphalt Division, The Ohio Oil Co., Robinson, Ill.

A NEW HALF-TON TRUCK

376. Complete information in regard to the new International ½-ton truck, which is equipped with an all-steel pick-up body 66 inches long and 46¾ inches wide, and is powered with a 6-cylinder engine, may be secured by those interested, from the International Harvester Co. of America, Inc., 606 S. Michigan Ave., Chicago, Ill.

A PICTORIAL CATALOG OF ROAD MACHINERY

377. Bulletin 1272 recently issued by The Austin-Western Road Machinery Co., 400 N. Michigan Ave., Chicago, Ill., pictures and describes the complete line of new Austin-Western equipment with new improvements and new low-cost operation in the highway and construction field.

A NEW SECONDARY ROAD PAVEMENT

378. A broadside describing the qualities and construction of the new cement-bound pavement for secondary roads has been issued by the Portland Cement Assn., 33 W. Grand Ave., Chicago, Ill., and will be sent free of charge on request.

CUSHIONS STOP RATTLE OF MANHOLE COVERS

379. The Philip Carey Co., Lockland, Cincinnati, Ohio, will be pleased to send its circular describing Carey elastite cushions for manhole covers. These cushions, made to fit any manhole cover, are molded in a continuous piece, are tough, strong, resilient and solidly reinforced, and are not affected by water or ordinary chemical solutions or gases.

If instead of writing direct to the manufacturer for these catalogs you prefer to send a list of the numbers you desire to THE AMERICAN CITY, we will secure them for you.

Maintain Your Bituminous Macadam Highways with Littleford Equipment

Whatever the job—whether penetration patch work, skin patching, surface treatment or re-surfacing—there is Littleford equipment to do the work. You may need only a 10-gallon "tar" kettle—and then again, a 1500-gallon pressure distributor may be what you require.

You know that it costs much less to maintain a road than it does to do a complete reconstruction job. You know that it is of vital importance to keep your present highway system properly maintained . . . We have the equipment that will help your maintenance gangs do their work efficiently. Get more maintenance mileage out of your highway dollar. Write for our complete catalog now. . . See the latest maintenance outfits we are offering.

THE Littleford Bituminous Spray Tank No. 101 is used for surface treatment, shoulder work, widening curves, penetration patching, etc. An ideal outfit for unemployment relief work. It handles material just like a pressure distributor—pumps material into its tank, circulates and heats material, and sprays. Costs half the price of a distributor. Made in capacities from 300 to 1200 gallons.

WHEN bituminous macadam highways get "fatty" and slippery, use the Littleford Surface Heater to restore the non-skid texture of the road. . . . This outfit is also used to soften sheet asphalt surfaces preparatory to patching. It's the only surface heater that can be satisfactorily trailed behind a truck.

LITTLEFORD
Road Maintenance Equipment
SINCE 1900
LITTLEFORD BROS. 500 E. PEARL ST. CINCINNATI, O.

Use LOCAL LABOR for making ! UNIVERSAL CONCRETE PIPE

Install sewer and storm drains with Universal concrete pipe manufactured right in your city. Our temporary plants will use your locally available concrete materials and unemployed labor. Send list of quantities and sizes and we will submit estimates without obligation. Small quantities usually shipped from any one of our six strategically located permanent plants.

Universal Concrete Pipe Co., 297 So. High St., Columbus, Ohio

THE STANDARD FOR 50 YEARS

Automatic Pressure Control Valves
Feed Water Filters — Portable Fire Hydrants
Hydraulic Engines — Hydraulic Booster Pumps

ROSS VALVE MFG. CO., INC.

ARCHIBALD STREET — TROY N. Y.

AER·O·MIX
AERATOR — MIXER

Patented

Combined—Low-head Aerator and Thorough Chemical Mixer for your water treatment plant

Write for information

VOGT BROTHERS MFG. CO.
INCORPORATED
LOUISVILLE · · KENTUCKY

SIMPLEX VENTURI TYPE METERS

ACCURATE—RELIABLE—SIMPLE—EASY TO CHECK AND ADJUST

Write for Bulletins

SIMPLEX VALVE & METER CO., 6743 Upland St., Philadelphia, Pa.

Manufacturers of Meters and Controllers of Venturi Type; Gauges; Air and Vacuum Valves; Air Release Valves; and other Water-Works Devices

The EDDY Hydrant

Eddy Fire Hydrants have many points that appeal to water-works men. For example:

A damaged valve can be replaced in a few minutes at slight expense.

Should the standpipe be broken, not a drop of water need be lost.

All hydrants are frost-proof.

These and many other points of excellence are thoroughly explained in our catalog, which it will pay you to study.

Also manufacturers of the well-known Eddy Valves

EDDY VALVE COMPANY
WATERFORD **NEW YORK**

Representatives
Jas. B. Clow & Sons, Chicago, Ill.
National Cast Iron Pipe Co., Birmingham, Ala.

Cast Iron Pipe

for Water and Gas

Cast Iron Pipe and Special Castings, Bell and Spigot, Flange, Flexible Joint, Culvert, Milled and Plain End Tubes, Cylinders, Flanged and Bell and Spigot Fittings, High Pressure Fire Service Pipe, Warren Short Body Specials.

Size 2- to 60-inch

Pipe manufactured in accordance with standard specifications adopted and approved by water works associations and engineers.

Warren Foundry & Pipe Corp.
formerly
Warren Foundry and Machine Co.

Sales: **Bowling Green Building, New York City**
Offices: **75 Federal Street, Boston, Mass.**

APRIL, 1933

Vol. XLVIII, No. 4

The American City

470 Fourth Avenue
New York

35 Cents, $2 a Year

A War-Time Slogan: "Give Till It Hurts"

A Peace-Time Slogan: "Spend Till It Helps"

DURING the World War many a dollar came out of hiding in response to the slogan, "Give till it hurts." The need is now for a new slogan to be proclaimed with equal patriotic fervor: "Spend till it helps."

As pointed out by the editor of THE AMERICAN CITY in the current number of the *National Municipal Review*, the fundamental cause of our present economic plight is not that our expenditures, public or private, have been or are too great in the aggregate, but that they have been and are unwisely distributed. In an age of vastly increased productive capacities there is no hope of achieving maximum well-being by enforced reduction of output of our factories and farms and governmental services.

Unbalanced Productive Capacity

During our late lamented boom period, government as a whole spent not too much, but too little; for if we had then taken warning of the growing unemployment on the farms and in the industrial centers, and had absorbed our surplus labor by greater and greater expenditures on well-planned public works, on the rebuilding of the congested and blighted areas of our cities, and on added facilities for culture and recreation for the masses of the people, we could easily have financed such construction and services, by scientific methods of taxation, out of our otherwise surplus productive capacity, with hardship to none and happiness for all.

Instead of this rational attack on the problem, we wasted our substance in riotous speculation and in the multiplication of unneeded facilities for competitive manufacture and farming and trade.

Where Is Economic Salvation?

Now what is the way to get out and stay out of this economic impasse? Whatever other nations may do, the safest pathway for the United States of America, THE AMERICAN CITY believes, is economic salvation not by fascism, or socialism, but by taxation.

By the intelligent raising and spending of public revenues we can replace our economic swamps and volcanoes with a high and productive plateau of general well-being. Paradoxical as it may sound, the taxing power, rationally applied, may be the most potent factor in restoring tax-paying ability.

The statement of budget-slashing advocates that "government cannot get the money to maintain its former scale of expenditures" is true, of course, of government in many individual municipalities. But every municipality is a political subdivision of a state, and every state is a member of the Federal Union; and for government as a whole there is certainly no fundamental inability to maintain or increase its former scale of expenditures. If some great nation were to declare war on us tomorrow, everybody knows that we could borrow or conscript billions of dollars and millions of men for the public defense; that the factory wheels would begin to hum; that we should stop worrying about surplus farm products; and that the railroads would soon be selling their upper berths again. Is it beyond our powers to organize our war against domestic destitution with the liberality and statesmanship of a war against foreign aggression?

Billions Rather Than Millions

The Administration at Washington is reported to be in favor of an expanded program of public works and of a liberalizing of R.F.C. aid to states and municipalities. To be really effective, however, such a program must be undertaken on a scale of billions rather than millions. Great advantages would be possible by the prompt issuance of five billion dollars or more in Prosperity Bonds, to be sold as were the Liberty Bonds during the war, thus bringing money out of hoarding and furnishing funds for direct relief and for a program of public works, national, state and local, on a scale vast enough to hasten the return of prosperity.

As Secretary of War Dern well said in his recent Boston speech, quoted on the front cover of this issue:

"This is no time for curtailing needed public improvements. On the contrary, they should be expanded, not merely as a make-work program for unemployment relief, but to prime the pump of industrial resumption."

Citizens' Councils to Urge Wise Public Spending

THE formation of a Citizen's Council in every municipality and county to work for the maintenance of essential community services and for constructive economy in local and state government, is proposed in a joint statement issued on March 20 by representatives of more than fifty national organizations. The statement follows in part:

The existence of many public and semi-public community services is threatened. Institutions and activities which have been considered the best evidence of our advanced civilization are being greatly curtailed, and in many places actually discontinued. How to secure the greatest possible public benefit from expenditure of public funds is the burning question that now faces every community. What can be done about it?

Our answer is: Organize local and state Citizens' Councils to consider the problems of maintaining essential community services in the face of the need for reduction of public expenditures. The objective of such Councils would be to promote interest in local and state governmental problems, to the end that the present widespread demands for reductions may produce actual and permanent improvements in government, the tax system, and the services rendered by public and semi-public agencies.

The local organization proposed will be called a Citizens' Council on Constructive Economy. It will be composed of representatives of local groups interested in good government, such as the League of Women Voters, the Parent-Teacher Association, women's clubs, labor groups, luncheon clubs, Chamber of Commerce, and other similar groups. It will also include representatives of public and semi-public boards, such as those concerned with schools, libraries, playgrounds, museums, health, welfare, and local colleges and universities. Each Council will be autonomous. Its purpose will be to secure for the public the greatest possible benefit from the expenditure of public funds.

The national organizations issuing this statement will ask their members to participate in the formation of local Councils. They will also send to their members suggestions as to how the Councils may carry on their activities.

The Citizens' Council idea grew out of informal conferences in New York, Chicago and Washington, following the Citizens Conference on the Crisis in Education, called by President Hoover in January. This movement is not, however, concerned with any particular service. It is an attempt to bring into existence Councils of local organization interested in all of the services, in good government and in real economy. Misinformation is rampant. It is expected that the first effort of each local Council will be to get the facts about costs and wastes of local government and actual services performed, as well as demands for service, and to pass these facts on to the members of the organizations which the Council represents. When there are recommendations to be made to public authorities, whether for elimination of waste or improvement of a service, Citizens' Councils, in cooperation with constituent citizen groups, will speak for the public at large, with adequate consideration of the city's needs and obligations, and should be able to secure such action as is clearly in the public interest.

A clearing house for information about Citizens' Councils for Constructive Economy will be maintained in the office of the National Municipal League, 309 East 34th Street, New York.

A New Aid for City Charter Modernization

By **HOWARD P. JONES**
Editor, National Municipal Review

THE new edition of a document which has probably had more influence upon municipal government in this country than any other single publication or piece of work has just come from the press. It might be expected that this vigorous generalization applied to a book like Lincoln Steffens' "Shame of the Cities," which jolted the nation from its torpor of thirty years ago, or at least to some scholarly treatise footnoted in every textbook and a classic of philosophical doctrine.

Quite the contrary. It is improbable that every word in the comparatively slight volume of 96 pages has been read by more than a thousand persons. Only approximately 13,000 copies of it have been sold. Yet directly or indirectly it has refashioned the government of hundreds of cities throughout the country and proved that public administration need not be slovenly and wasteful and can be efficient.

The document is the Model City Charter of the National Municipal League, now in its fourth edition. It has been the custom ever since the first Model Charter was adopted in 1900 for the authorities and experts responsible for its text periodically to revise it and bring it up to date in accordance with the latest experience. Thus it is a living as well as an historical document, representing the accumulated experience of American experimentation with the machinery of democracy.

The 1933 revision, like its predecessor, rests upon a foundation of the manager plan with proportional representation. The text has been clarified and improved in many places where experience has shown improvement could be made.

The provisions of the charter establish as the legislative body of a municipality a city council of five or more members, elected from the city at large under a system of proportional representation which guarantees to each group in the population representation on the council in direct proportion to its voting strength. The city council appoints the city manager, who is responsible for the efficient administration of the city government and who in turn appoints his subordinates, subject to civil service provisions.

Since proportional representation cannot be adopted in all states at the present time, an alternative system of non-partisan election at large is also recommended. Nominations by petition are recommended, whichever system of election is employed.

The chief modifications in the new Model Charter include new sections relating to the department of finance; complete revision of the sections on city planning and zoning to keep pace with the rapid advance in these fields during the past decade; and the appearance of slum clearance and blighted area provisions for the first time. [See page 48 of this issue.]

An innovation also appears in the appendix to the document in the report of a committee of the International City Managers' Association on objectionable charter provisions. To know what to keep out of a charter is often as important as to know what to put in, the committee emphasizes.

Street Maintenance Practice in European Cities

By DONALD C. STONE*

International City Managers' Association

THE importance of keeping the surface of a road intact and waterproof is appreciated fully by British road engineers. They recognize that the surface must be sealed at least every two years; otherwise quick deterioration of the road will require excessive maintenance expenses later on.

The most common materials used for such surface treatment are tar, a compound of tar and bitumen, bitumen, and bitumen emulsion. Tar is obtained from gas works, which are maintained by most of the cities in Great Britain. A very common mixture of tar and bitumen consists of the proportion of about 75 per cent of tar to 25 per cent of bitumen. Tar alone is used only for the first treatment. Bitumen emulsion has in the last two or three years received widespread use and is becoming very important in surface treatment. A bitumen portion of 60 to 65 per cent is a maximum. It is spread with the use of squeegees or sprayed with pressure tanks. Its chief merit is that it can be used when the road surface is damp and in the winter time. Chips are applied and rolled-in immediately, and the road is closed for two or three hours to give the treatment a chance to set.

Rolling is given great emphasis in English practice. No maintenance, except small patching, is performed without the use of a roller. Every application is rolled and re-rolled, with special effort to make the surface as compact and level as possible, and I believe this rolling explains in part the excellent surface on British roads.

The use of asphalt alone and also of tar-asphalt compounds is extending rapidly. These materials are applied hot by gravity under pressure, or off revolving blades. Spreading from a tank by revolving blades is considered by one county surveyor to be the best system. Chips are usually applied with the aid of mechanical equipment.

Resurfacing Methods

Five types of materials are used commonly for surface coats: (1) water-bound or dry-bound macadam; (2) tar macadam; (3) tar- or bitumen-grouted macadam; (4) tar macadam with a squeegee coat of filled bitumen; and (5) asphalt.

Water-bound macadam is nearly a thing of the past, and dry-bound macadam, although much more satisfactory than water-bound, is also being given up for more permanent methods. The average cost per square yard of dry-bound macadam is about 48 cents. Tar macadam has proved to be one of the most satisfactory forms of construction. It is spread and rolled to a thickness of 3 or 3½ inches, and the surface is covered with ½-inch chippings and rolled. The street or road is usually closed to traffic for a week. After a month or two the surface is swept and sealed with a tar-bitumen compound or bitumen emulsion and again covered with ½-inch chips and rolled thoroughly. Every two years it is given a similar surface treatment. The cost of such treatment per square yard is approximately 75 to 85 cents.† It should be borne in mind that wages in England are very much lower than in the United States.

A form of construction considered more suitable for roads carrying a heavy volume of traffic, say 4,000 to 5,000 tons per day, is the laying first of a tar macadam coat and then on top a coat of filled bitumen applied at a temperature of about 350 degrees and with ½-inch to ¾-inch chippings well rolled. Its cost runs from about $1.00 to $1.30 a square yard. Within cities, and on other roads carrying heavy traffic, a large amount of asphalt is employed. The general practice now is to lay a base coat of bituminous macadam about 2½ inches thick on the old road. Then on top is placed a coat of asphalt about 1 to 1½ inches thick. Pre-coated chippings ½- to ¾-inch in diameter are rolled-in to provide a rough and strong surface.

Cement Concrete and Wood Block Practices

Cement concrete has not been used extensively in the past, which is readily explained by the development and improvement of both city streets and rural highways over a long period of time. Many of the new highways are given a concrete base, and in a few instances they are constructed of cement concrete throughout. Concrete is laid with a small stationary mixer and in very small sections at a time. Because of the absence of surfacing machinery, the final result does not compare favorably with the best cement concrete roads in the United States.

Wood block is prevalent in city streets. It is laid upon a very good base and surface-treated just as any other type of block-top street. Chips are spread and rolled during such treatment, which over a period of time builds up a surface on the wood block from ¼- to ½-inch thick. The chips and tar or bitumen are imbedded in the wood, giving an impervious cover. Slipperiness is also eliminated. Whether or not this treatment is the explanation, wood block paving has proved very satisfactory, according to several city engineers. Buckling and uneven wear are not a problem. Although the winters in England are less rigorous than in the northern portion of the United States, the climate is very damp.

Street Construction and Maintenance in Paris

Paris has little to offer in the field of street construction and repair. All construction work and almost all maintenance work, except that of an emergency nature, is performed under contract. A continuous study is made of different types of pavement to determine the most economical type for each set of conditions. The cost of construction and maintenance is available for each street, although the method of contracting for maintenance work

* The author is indebted to a score of city and county engineers in England and Scotland for the data given; also to the Institution of Municipal and County Engineers.

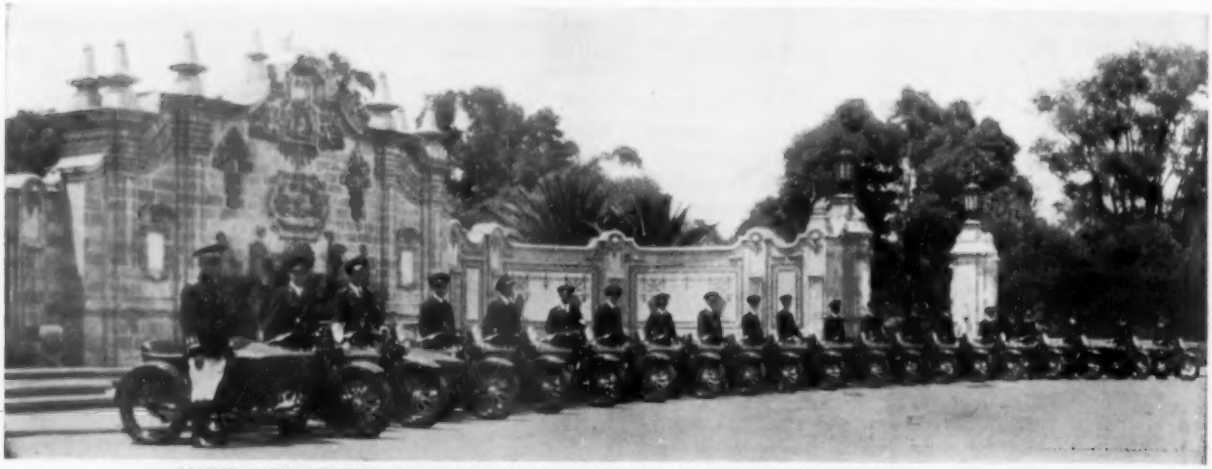
† Calculations based upon the pound at $4.86.

does not lend itself to effective administrative discretion from the economic standpoint.

The pavement is mainly wood block, asphalt, granite block, and concrete. As in England, wood block is treated frequently, which seals the wood from moisture, and good, though expensive, results have been secured. The city engineers have come to the conclusion that concrete is a most efficient pavement, and many streets are being laid with it without any additional surface cover. A surfacing machine of two cylinders which rolls from one side of the street to the other provides a very good top but not nearly as fine as the surface tamping machines in the United States.

ACKNOWLEDGMENT.—From "Some Observations on Municipal Practices in European Cities," published by The International City Managers' Association.

Motor-Mounted Police of Mexico City



MOTORCYCLE SECTION OF THE POLICE DEPARTMENT OF THE FEDERAL DISTRICT OF MEXICO

This is composed of 20 officers, each in charge of two policemen assigned to motorcycle duty. There are 20 Harley-Davidson motorcycles with side-cars, equipped with short-wave radio receivers for the reception of orders from headquarters

TRAFFIC DIVISION

This consists of 397 Harley-Davidson motorcycles divided into six squads, for duty in different parts of the city. All are under a division chief. The photograph shows a part of Squad 5, at the entrance to the Woods of Chapultepec

Photographs by courtesy of the Police Department, Mexico City

ROAD MOTORCYCLE SQUAD

This is another traffic section consisting of 50 motorcycles for duty on roads leading outside of the Federal District. Half of them are assigned to the road sentry boxes

Rebuilt Water Works Includes Softening

By E. L. LIUM
City Engineer,
Grand Forks, N. Dak.

THE advantages of soft water in the home have long been recognized. This fact is evidenced by the building of reservoirs and cisterns to collect rain-water and other soft surface supplies when hard water may be far more accessible. The preference for soft water by the average consumer is most clearly demonstrated in cities where the municipal supply is of a moderate degree of hardness, and where in spite of this fact new cisterns are constructed by private persons to furnish a soft water for the family washing and for practically all domestic uses except cooking and drinking. People's preference for soft water is also manifested by the installation of private softening plants in some of our better-equipped homes and in hotels in cities where the municipal water is of a moderate degree of hardness.

For many years past the question of municipal softening of water has received a great deal of publicity in cities. It is still undergoing considerable debate on the part of city governing bodies, but, generally speaking, great progress has been made in the last few years due to changes in equipment and methods employed in municipal softening processes.

Some Complaints About Softened Water

After the installation of the softening plant in Grand Forks it was found in some instances that women were having difficulty in making their clothes come out white and clean from the wash. On examining clothes hung out to dry on the clothes-line, it was found that the clothes that refused to come out clean and spotless were completely saturated with soap products. This, of course, was due to the fact that the same amount of soap had been used with the soft water that had been previously used with the hard water. The heavily saturated soap water had so filled the clothing that it required a great deal of rinsing before the clothes would come out free of soap. These complaints were quickly remedied by advising the consumer to cut down on the soap used in washing.

Another rather amusing reaction noted from the starting of the softening process was that of people washing dishes in restaurants. One or two of these people remarked to the writer that apparently something was wrong with the soap which they had been using during the last day or two, because there were just piles of suds that had never been present before in the wash water. In cases of this kind it is evident that there is perhaps little saving to the consumer when a municipal softening plant is first started, but these two examples serve to bring out the fact that, whether he wants to or not, the consumer is actually forced to reduce his soap consumption by an appreciable amount when the water he uses is suddenly reduced in hardness by an amount exceeding 160 or 170 parts per million.

Upon asking people whether they noticed any saving in their soap consumption, we received answers of different natures. Some women stated that they did not notice any great saving in soap, but they did notice that they had soap-suds when they washed, while prior to the softening of the water they had no suds. In cases of this kind it is apparent that not enough soap had been used to produce suds with the harder water. Others frankly admitted that they had noticed a considerable saving in their soap consumption. Others noticed that they saved several sticks of shaving cream per year.

There were, of course, those who did not like the taste of soft water, in spite of the fact that it had been proved experimentally in several cities that the average man or woman cannot detect a difference in the taste of hard and of soft water. Blindfold tests have been made on soft water similar to those that are so often enjoyed as light pastime in determining brands of cigarettes, and these tests have forced the participants to believe that softening the water can in no way spoil the taste. In spite of these proofs and these experiments, we do find the occasional consumer who objects to the water because it tastes so soft and because it is so soft to the sense of touch.

We also find the consumer who objects to the softened water because of the tremendous amount of chemicals that are placed in it and the extreme amount of doctoring that must be necessary to make it so soft. This complaint comes from the type of consumer whom it would be impossible to satisfy unless he were first given a rather complete course in chemistry and taught to understand that instead of adding to the chemicals in the water the softening process actually removes the bulk of the chemicals that are already present in the water when it comes to the treatment plant. These specific types of consumers and consumers' complaints have been referred to because they bring out the human-interest side.

About 95 per cent of the consumers of our municipal water are highly pleased with the new product and recognize that it is far superior to that which they were accustomed to before municipal softening was begun. We know also that if an attempt were made to return to hard water, complaints would be very numerous and undoubtedly the city would be forced to go back to softening in a very short time. The use of soft water is something that one has to have taken away before he can fully realize how much he has enjoyed it.

Operation of the Grand Forks Plant

The treatment now employed consists of the following steps in the treatment plant:

1. Aeration and pre-mix in aeration chambers, at which point lime, sodium aluminate, and soda ash are applied as the principal softening and coagulating agents.
2. Coagulation in two mechanical mixers.
3. Clarification in what is termed Clarifier Number I.

4. First carbonation, at which point sufficient carbon dioxide is applied to the water to remove practically all of the caustic alkalinity.

5. Second clarification, in Clarifier Number 2.

6. Second carbonation, in which sufficient carbon dioxide is applied to the water to bring it back to pH of 8.3 to 8.6.

7. Filtration through sand filters.

These are the steps necessary to soften the water. The water source is the Red Lake River, flowing from Red Lake in northern Minnesota. It is a typical surface water having a high magnesium content, and for that reason very adaptable to the excess lime method of softening. During April, 1932, however, the sulphate hardness in the raw water suddenly jumped from 10 parts per million to 100 parts per million. This made it necessary to use soda ash as well as lime to affect a tap water with a hardness running close to 80 parts per million. Since then we have been using soda ash as well as lime.

The chemical dosage has varied greatly for several reasons. It takes time for any operator or group of operators to learn what represents proper dosage of chemicals to effect the softening desired. It takes equipment that is well suited to apply the chemicals necessary for any close control in their application to water. Add to these the fact that the water itself persists in changing its characteristics in a few hours without serving notice on the plant, and it is readily understood why it has not been possible to make a rule-of-thumb for the plant operators for adding lime and other chemicals. Plant operation from the standpoint of chemicals used presents a new picture almost daily. On the basis of average conditions at the plant at the present time, dosage of chemicals and results are roughly as follows:

Lime	17 grains per gallon
Soda ash	2 grains per gallon
Sodium aluminate	.65 grains per gallon

This dosage reduces the hardness from 278 parts per million in the raw water to 81 parts per million in the tap water; an actual reduction of 197 parts per million, or 11.6 grains per gallon.

Other Improvements

It is often possible to take an old water-works plant and so revamp it and replace antiquated machinery therein that municipal softening and better plant processes may be enjoyed at no additional cost in the total operation of the plant. By changing the intake system and replacing old pump units of large size with the proper units of small size having flexibility to take care of varying loads at Grand Forks, a saving in raw water pumpage alone has been effected that very nearly makes up the difference in cost in chemicals due to the softening process. In checking over the combined costs of pumpage and chemicals per million gallons of water for the past four years, it is interesting to note that this combined cost per million gallons in January, 1930, was $62.70, while in January, 1932, it was $60.93, or actually $1.77 per million gallons less under the new process in which softening is accomplished. This is not true for all the months, and the average combined cost at the present is slightly higher than it was prior to the beginning of the softening process. A change in pumpage to the Great Northern Railway is being made which will throw the balance still more in favor of the present system. The railroad is abandoning the use of raw river water at a cost of 5 cents per 1,000 gallons and will use treated water instead at a cost of 12 and a fraction cents per 1,000 gallons. It is willing to pay the difference of 7 cents per 1,000 gallons to receive the benefit of the softened water.

Comparative Costs

In the planning and preliminary work on a new municipal plant the question is invariably asked the city officials: "Will the new process or the new plant treat our water more cheaply than the old plant is doing?" This question is asked because it is in most cases necessary to justify a new plant of any type in savings involved. In asking this question no thought is given to the quality of the treated water from the proposed new plant as compared with the water coming from the old plant. To most officials water is water, and it can be nothing else but water. In cases of this kind, it is almost necessary to show a saving in operation, even with the benefits of softening thrown in, before a softening plant can be constructed. I have been asked several times whether we are producing water as cheaply now as we were with the old plant, and I have been able to say truthfully that even though we are not producing it more cheaply we are producing it at very nearly the same cost, and the difference in the quality of the water justifies to the average layman the expenditure of the money invested in the new water plant.

Taking the average cost of chemicals at Grand Forks for the year 1929 as a base and comparing it with the chemical cost for the year 1932, which now includes softening, the increase in chemical cost amounts to $14.25 per million gallons. An average 36 million gallons per month is treated, giving an added cost of chemicals per year of $6,156. The increased cost to the consumer due to the construction of the softening plant is represented by the retirement of a $50,000 bond issue over a period of 20 years. The entire water-works improvement program, including new intake, added clear-well storage, elevated tank, new distribution mains, and softening plant, amounted to $225,000, and of this amount $50,000 can be correctly charged to the introduction of the softening process. If this were retired over 20 years with an interest rate of 6 per cent, the cost would amount to $4,000 per year, making the total cost to the water consumer due to the softening process $10,156 per year.

Other Advantages of Softening

There are several other advantages of the municipal softening plant besides soap saving to the consumer. Some of the most important of these are as follows:

1. Greater assurance of continued effective bacterial removal in the treatment plant, and also much longer filter runs.

2. Better boiler performance in industrial work and in all boiler type heating plants and hot-water heaters.

3. The satisfaction of using soft water to wash with.

4. The necessity for less scrubbing and rubbing in the family washing, and the cleaner, neater appearance and longer life of linens and garments.

5. The cleanliness of toilet fixtures without the continued scrubbing to prevent the usual ring around the bath tub and discoloring of other fixtures.

With the use of sodium aluminate, lime and soda ash,

necessary in the softening process, a very heavy flaky floc is formed which is effective in removing suspended solids and carrying down the hardness, and also in removing bacteria from the raw water. The causticity of the water caused by the application of the excess lime itself is a good sterilizing agent. The water on top of the filters has improved in quality to the extent that filters that were washed as frequently as twice a day now operate as long as eighteen days without being washed.

There are several industries in Grand Forks that are enjoying the use of soft water in their boilers, and they are highly pleased with the water and are effecting considerable saving in boiler compounds and softening reagents. This is true not only in industries using boilers but also in laundries and hotels.

The cash value of these last advantages in any city would be impossible to determine. Personal satisfaction in the use of soft water is perhaps one of the big factors in the justification of a municipal softening plant, and no cash value could be placed on it. Municipal softening carries with it a great number of benefits and savings to the water consumer, but, like many other things, they are never fully realized until one has become accustomed to the use of soft water for some time and then suddenly has to use hard water instead.

ACKNOWLEDGMENT.—From a paper presented at the North Dakota Water and Sewage Works Conference.

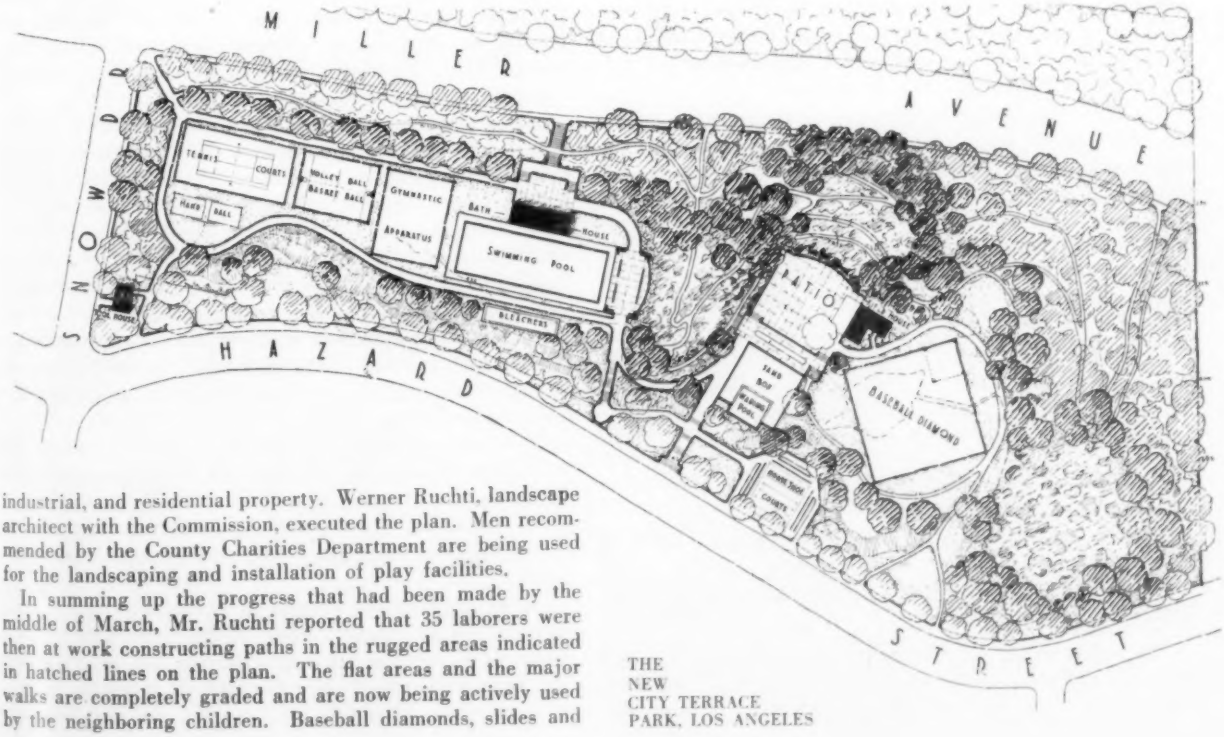
Model Park and Recreation Area Dedicated by Subdivider

THE Regional Planning Commission of Los Angeles has designed, and the County Recreation Department is supervising, construction work on the new 10-acre City Terrace Park at Hazard Street and Snow Drive, that city. Plans for the development are ideally adapted to the site and make provisions for the present and future needs of the section. They include a playground with tennis court, gymnastic apparatus, handball court, horseshoe court, soft-ball diamond, wading pool with a sand court adjoining it, rest rooms and workshop, and a Spanish patio 80 by 80 feet for picnic lunches. Space has been reserved for a large swimming pool for future construction. The park portions will be heavily wooded, with rambling paths on the slopes too steep for active play purposes.

The site was dedicated to Los Angeles County by the Walter H. Leimert Co., developers of more than 100 acres of business, industrial, and residential property. Werner Ruchti, landscape architect with the Commission, executed the plan. Men recommended by the County Charities Department are being used for the landscaping and installation of play facilities.

In summing up the progress that had been made by the middle of March, Mr. Ruchti reported that 35 laborers were then at work constructing paths in the rugged areas indicated in hatched lines on the plan. The flat areas and the major walks are completely graded and are now being actively used by the neighboring children. Baseball diamonds, slides and sand boxes have been constructed, and baseball, track, and other children's games are being supervised by the caretaker in charge. Over the week-end of March 11 and 12 between 250 and 300 children visited and played on this area—and this despite the earthquake.

Within an area of approximately one-half mile radius all unemployed within this section had an opportunity to procure work in the development of this small project. As compensation, they were given groceries and a small amount of money for tobacco. The laborers were mostly taxpayers within this area. It is safe to say that had it not been for the depression, this particular area would not have been developed for a number of years, particularly because this section of the country is very poor and unable to finance a project of this kind. The people appreciate very much any recreation facilities provided, and use them extensively.



THE NEW CITY TERRACE PARK, LOS ANGELES

High-Speed Diesel Engines for Water-Works Pumping Stations

By ELLIOTT EARL

Consulting Engineer, Boston, Mass.

TWENTY years ago when the cost of labor and fuel and supplies was relatively low, a certain new pumping station of the steam, crank and flywheel type had a possible daily capacity of 145 million gallons. It had a daily average duty of 61,740,000 for an average lift of approximately 84 feet. In terms of equivalent power costs, the plant was operating for a cost of 8.3 mills per equivalent kilowatt-hour. Fixed charges are not considered. In 1920 the plant was unchanged. It was pumping for an equivalent of 20.8 miles per equivalent kilowatt-hour. The plant, unchanged, is still operating today. In 1931, the daily average was 54,500,000 gallons for an average lift of about 84 feet. The cost was approximately 16.4 mills per equivalent kilowatt-hour.

A comparison with a mythical electrically operated pumping plant and an actual diesel powered pumping plant is interesting. If electrical power could be purchased for 11 mills and this source of power utilized satisfactorily, there would be a possible saving of 5.4 mills per equivalent kilowatt-hour. There is in operation today a diesel engine power plant, described by H. N. Anderson in the October, 1932, issue of *Diesel Power*, which has a power rating comparable to the aforementioned pumping plant. For the last year the plant has produced power for 6.41 mills per equivalent kilowatt-hour. Comparing this cost with some of those as reported in the A.S.M.E. Oil Engine Power Report for 1931, it is low but not exceptional. In a pumping station it is advisable to connect the diesel directly to the pumps to obviate conversion losses. The saving per equivalent kilowatt-hour is then 10 mills, or 1 cent, with the diesel plant.

Reducing this savings to dollars annually, and assuming that the present steam plant costs in the neighborhood of $86,300 annually to operate, there would be a saving of $28,600 per annum if the purchased power were utilized as prime-mover equipment. With a properly engineered diesel installation, the indicated savings are about $52,500 per annum. Going into the matter a little further and assuming that the diesel plant has a burden of approximately 4.6 mills per equivalent kilowatt-hour, it could still show a saving equal to the electric installation. Another way of looking at it is the amount available for plant retirement. There would be approximately $24,000 available per year, over the purchased power method.

Some Advantages of High-Speed Diesel Engines

High speed and small size are relative terms. By high speed is meant any engine with a piston speed of 1,200 feet per minute or more, and by small size is meant cylinders having diameters of 8 inches or less.

There are very good reasons why we should keep down the sizes and increase the speed of our engines. By keeping down the size we shall gain considerably in first cost, inasmuch as we are not required to buy a lot of unnecessary cast iron. We shall gain in burden charges, since unnecessary speed increases by gears will be eliminated. We shall, above all, keep clear of heat stresses.

The obvious essential advantage of light weight is ease of transportation. The other advantage is low cost of manufacture. The gasoline engine today costs from $5 to $15 per horsepower, according to the manufacturer's production ability. There is no reason why the high-speed diesel should not ultimately come down in this range. Certainly the workmanship and material required are no better than those necessary in a reputable gasoline engine.

It is believed that we are on the eve of seeing the light high-speed diesel turned out in quantity production. One diesel manufacturer is known who has an oil engine which will satisfactorily compete with his own best gasoline product. If such is the case, we should revise our ideas as to prime-mover requirements. In the first place, the efficiency of a diesel engine is independent of size. The diesel engine's chief competitor is the super-power steam plant, which is efficient only in very large units. Where diesels are concerned, it is contended that we should employ a number of units of the smaller size. First of all, we shall gain in efficiency of operation, since the plant and each individual unit can be operated at the most economical load factor. Second, first cost will be lowered. Third, and most important, there will be increased reliability of operation.

The arguments in opposition to this reasoning seem to lack weight. One is asked to look with ridicule at a power plant or pumping station having a series of diesel engines installed with anywhere from 4 to 40 pistons and with their accompanying 8 to 80 valves, all of which, with their accompanying lubrication systems, cooling systems and fuel injection systems, must function properly at all times. We are then asked to look with comfort and assurance at a pumping station or power plant which has a turbine or an electric motor doing the same work. At first glance we may say the comparison is appalling. Let us analyze it a little more closely.

We know that with a multiplicity of diesel units, one, two, three or four may go wrong all at the same time, and the rest of the installation will carry the load temporarily while the faulty units are being repaired, assuming, of course, that the plant has been properly engineered at the outset.

Let us consider the turbine as a single-unit plant. Inside the simple outside casing of the turbine there are a thousand or more small blades, unseen but not forgotten. The failure of one of these blades will bring the turbine to a complete standstill, and if you are not fortunate

enough to have provided for suitable standby equipment, your system is without a source of supply. Happily, the pictured occasion is fairly remote.

The electric motor has no blades, and from a casual analysis of its reliability, it could safely be said that there are few other pieces of machinery with as much inherent reliability. In using an electric motor, unfortunately, there must be an outside source of power. The station is then subjected to all the inherent weaknesses of a steam or hydraulic power plant, plus the possibility of transmission line failure, in addition to the remote possibility of control equipment and motor failure. The electric motor with an outside source of power supply is not a good solution of the pumping station problem, as one community found out last winter through transmission line failure.

Now let us reconsider the diesel engine as a prime mover or standby equipment for the pumping station. The chance of two or three diesel engines failing at the same time is beyond the bounds of probability and almost of possibility. The diesel engine of today is just as reliable as any gasoline engine ever built. There is a reason for this: when you eliminate the carburetor and ignition system from any internal combustion system, you have eliminated practically all the sources of trouble. Such an engine is the diesel.

It is my confirmed belief, along with many other engineers, that the diesel engine of the near future will be a small high-speed unit of such size that it can be turned out cheaply, and where large power concentrations are needed, we shall employ a battery of these units. Our method of handling them will then be much as we handle our trucks and our cars today.

The Fuel Injection System of Diesel Engines

The injection of fuel in a compression ignition engine has definitely trended towards the so-called solid injection system. Solid injection is that type of fuel injection system which does not utilize compressed air in the process of injecting the fuel. The English way of expressing it as "airless injection" is perhaps a little more rational. For the injection of certain types of the heavier grades of fuel oil, however, air injection possesses advantages which are not offered by the solid injection system.

The lack of agreement between engineers regarding the method of introduction of the fuel has resulted in many different designs. The two outstanding systems commercially available are made by specialty manufacturers. One is called the Bosch system and the other the Compur system. Both are of the jerk pump type.

The types of systems in existence today may be conveniently divided into two groups—first, the jerk pump, and, second, the conventional or constant-pressure system. In addition to these there are many modifications, which include distributor types and miscellaneous types which are mixtures.

The parts that go to make up the conventional system are the nozzle or injector, the fuel pump, the supply line, and accessories, the latter forming a very important part of the system. When one considers the size of the passages in the fuel injection system, it will be seen that the introduction of dirt and water will cause considerable damage. This fault was common to early American plants. It has been completely overcome through the development of the centrifuge and filtering equipment, the cost of which adds very little to the total first cost.

An injection system has five duties to perform in order to introduce the fuel into the combustion space in an economical and rational manner. It must clean and transport the fuel from the storage tanks to the combustion space. It must accurately meter the fuel under all load conditions. It must time the fuel injection period with reference to the position of the piston. It must properly atomize the fuel, and properly disperse it.

Cleaning the fuel is accomplished by centrifuges, and transporting it from the tanks to the combustion space is usually handled by low-pressure pumps. If heavy fuels are to be used, a consideration of the heating problem is important, since it has been shown that viscosity is a function of the temperature and more recently it has been shown that viscosity has a great deal to do with atomization.

The elimination of air in the fuel injection system is of the utmost importance. Fine wire mesh screens and filters will help on this point. The last four points are design problems, and with the properly designed system, of which the Bosch is one of the best, no trouble may be expected from them. In passing it might be said that early American design did not recognize the existence of these problems. The result is that some of the people who invested in the engines are sorry. Without any hesitation I condemn them as being the cause of the late adoption of the diesel in this country.

Continuing with the discussion of the fuel injection system, it should be insensible to the factors of speed, load, fuel, clogging, erosion and wear. Further consideration of the system suggests the following: simplicity of construction, ruggedness, freedom from the possibility of the introduction of air. Air in the fuel injection system of a diesel engine has the same deleterious effect on the engine that many have experienced by getting water in the carburetor of an automobile engine. Most of the trouble, if there is any, with a diesel can be traced directly to the fuel injection system. It is common sense for the operator to know as much as he can about it.

Fuel for Diesel Engines

The question of what kind of fuel should be burned in a diesel is a good one. It has caused considerable discussion of late. In a paper presented before the summer meeting of the Oil and Gas Power Section of the A.S.M.E., this year, Ed. Stalnaker, a consulting engineer, goes into the question with Bunker C oil as a background. The representatives of the oil companies present took exception to what he said, in no unmistakable manner. The upshot of the whole matter is this: with the proper engineering supervision, there is no reason why any diesel will not burn any fuel designated which contains the proper fuel heating value, and the proper physical properties, which in turn will permit of injection. There has been a lot of loose talk in the past about fuels for diesel engines, including the suggestion by the lay press and others that these engines would be able to run on any kind of oil, even refuse oil from some other engines. That these engines will run on this type of fuel is a fact, but that such operation is advisable is another matter. There is a committee in existence today, cooperative in nature, com-

posed of some of the best minds in the American Society of Mechanical Engineers, the Society of Automotive Engineers and the American Society for Testing Materials, who are working on the problem of the standardization of diesel fuel oil. Until the time that these standards are set, it might be wise to abide by the decision of the manufacturer in regard to the matter of fuels. The net cost of operation will probably be slightly in favor of the lighter fuel.

Conclusion

We are accustomed to telling ourselves that we live in an age of progress. All new ideas fight with old. All changes in organization, all modifications of practice, mean that a new method either wholly or partially ousts an old. That is what progress means. If we really believe that we are progressing, what is the use of buying engines that last more than ten or fifteen years? Our fathers and forefathers were wont to boast that they built machinery to last a lifetime. In so doing they built mighty impressive monuments to themselves but mighty embarrassing heirlooms for their descendants. Today, much of our trouble is due to the sturdy vitality of machinery which has long since grown obsolete, paid for itself, and will not die.

We have seen that a diesel engine is theoretically and practically the most efficient type of prime mover made today. While it is not claimed that diesel engines are going to be the universal panacea for that disease known as "costly power," it is claimed that they should be investigated as a means of lowering pumping costs, and as one of the most reliable types of prime mover and standby equipment. It is not claimed that the diesel engine will guarantee an adequate supply indefinitely. What is claimed is that if a pumping station is powered with diesel engines, assuming that it has been properly engineered, you have a more reliable source of water supply, for a somewhat lower net cost.

In the words of H. R. Ricardo, "Low first cost, light weight, little space requirements, ease of transport, reliability—these are our needs. Why not be content to recognize them, leaving something for our descendants to use a free hand on with their better knowledge and altered conditions?"

ACKNOWLEDGMENT.—From a paper presented before the New England Water Works Association.

Modern Charter Provisions for Curing Slums and Blighted Areas

THE new edition of the National Municipal League's Model City Charter (see page 40 of this issue) contains the following new sections relating to slum clearance and blighted areas which are of special current importance because of increased interest in large-scale housing in cities:

Section 106. *Plans for Slum Clearance*

The planning commission shall have the power, from time to time, to make and adopt plans for the clearance and rebuilding of slum districts within the municipality. Any such plan shall include the defining of the boundaries of the district recommended to be cleared, the proposed location of new or relocation of existing streets and other public open spaces within the district, the location and general type, character, bulk, height and use of the new buildings to be erected or permitted within the cleared area, and the location of private open spaces proposed as a part of the plan. Upon receipt by the council of any such slum-clearance plan, council may adopt such plan, provided that, before proceeding to such adoption, council shall hold a public hearing thereon, notice of the time and place of which shall be given not less than ten days previous to the time fixed therefor by one publication in a newspaper of general circulation in the municipality and by mail to the record owners of the lands and buildings included within such planned district. After such hearing the council may adopt the plan as submitted by the planning commission or as may be modified by council; proposed modification shall have been submitted to the planning commission and either approved by it or, if disapproved, receive the favorable vote of not less than two-thirds of the entire membership of the council. After such adoption of any such slum clearance plan, the council may proceed to carry out the same, and, for such purpose, the council is hereby granted the power to acquire by purchase or condemnation all privately owned land, buildings and other real property interests within the district; to establish, locate, relocate, build and improve the streets and other public open spaces provided for in the plan; to vacate any street or portion of any street as may be provided for in the plan; to build the buildings or other structures in accordance with the plan; to maintain, operate, lease or sell said buildings or any of them; to sell the land or any part of the land designated in the plan for buildings and private open spaces upon such terms and conditions and restrictions as to buildings, uses and open spaces as will substantially carry out and effect the plan; and, in general, the council may do or bring about all things incident or necessary for the substantial carrying out and effecting of the plan in both its clearance and its rebuilding phases. For the accomplishment of the purposes and powers specified in this section of this charter, the council may exercise all powers of acquisition or appropriation of property or property-interests, taxation, special assessments, incurring of indebtedness, issuance of bonds, zoning and all other powers granted to it in this charter or by law. For the reduction of delinquency and vice, the promotion of public health, the promotion of good housing, the preservation of the economic strength of land and property within the municipality and the development of the territory of the municipality in accordance with good planning, the clearance of slums and the exercise of the powers granted to council in this section of this charter are hereby declared to be a public purpose and a public use.

A slum district is defined as an area or neighborhood the buildings in which are used predominantly, though not necessarily exclusively, for habitation and residence and in which, owing to the age, design and character of the buildings, the inadequacy of open spaces in proportion to built-upon spaces, the poor distribution of open and built-upon spaces, the existing plan and arrangement of lots and streets and utilities, the types of business or industries which have invaded or surrounded the district, or other causes and factors, the physical conditions are not conducive to the physical and moral health of the inhabitants and residents and present difficulties and handicaps to the attainment of sanitary, hygienic and moral standards, which difficulties and handicaps may be removed or lessened by the replanning and rebuilding of the area or neighborhood.

Section 107. *Blighted Areas*

The planning commission shall have the power, from time to time, to make and adopt plans for the rehabilitation of blighted areas within the municipality. Any such plan shall include the defining of the location and boundaries of the area recommended to be rehabilitated, the location of new or the relocation of existing streets and other public open spaces within the area, the location and general type, character, bulk, height and use of the new buildings to be erected or permitted within the rehabilitated area, the reconditioning of old buildings to be reconditioned, and location of private open spaces proposed as a part of the plan. The council shall have all the powers to adopt, modify and carry out or effect the carrying out of any such plans that are provided or referred to in section 106 in relation to slum-clearance plans and shall conform to the procedure set forth in said section 106. For the promotion of public convenience and prosperity, and for the preservation of the economic strength and vitality of land and property in the area and of the area's contribution to the economic strength and taxable valuation of the municipality, and for the development of the territory of the municipality in accordance with good planning, the rehabilitation of blighted areas and the exercise of the powers granted to council in this section are hereby declared to be a public purpose and a public use.

A blighted area is defined as an area in which, owing to the obsolescent condition and character of the buildings therein, the existing division or arrangement of lots and ownerships and street and other open spaces, the mixed character and uses of the buildings, and other factors and causes, values have depreciated, with consequent decline or stagnation of development and damage and loss to community prosperity and taxable values, and where a restoration of the economic vigor of the area and of its attainable contribution to the economic strength and prosperity of the community may require a replanning of the area, and, for the accomplishment of such replanning, a concentration or redistribution of ownership or developmental control is requisite.

The Municipal Administration Service has moved from New York to 850 East 58th Street, Chicago

A Low-Cost Permanent Type Pavement

Methods of Construction Used in Grass Valley, California

By DON M. HOFFMAN
Edward R. Bacon Co.,
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THE city of Grass Valley, located on the western slope of the Sierra Nevada range, has a population of 3,810 people. The 1929 tax rate was $1.40 and the average income from all sources is about $58,600 annually. Within the corporate limits of the city there are 20 miles of streets under maintenance. Of this, about 10 miles are paved with portland cement concrete for a width of 18 feet except on several main business streets which are paved for their full width. The concrete pavement was constructed by contract, from money obtained through a bond issue some years ago. The remaining streets are of gravel and earth. Owing to the comparatively heavy precipitation, coupled with the hilly topography, maintenance of these streets has always been expensive. Each year it has been necessary to re-spread gravel and shape up the streets by grader and tractor; and during the summer months, sprinkling has had to be resorted to in order to lay the dust. It has always been difficult to keep a smooth surface throughout the summer, on account of a considerable amount of motor traffic.

Governed by the limited finances available, as well as by the lack of an organized engineering department, a condition common in most cities of this size, the City Board of Trustees undertook to find ways and means of improving these streets. The limited finances were a ruling consideration, but the Board were unanimous that only a first-class type of hard-surfaced street would be acceptable. After careful consideration, studies of practically all types of hard-surfaced pavements that were economically within their limits to construct, a penetration type of asphalt macadam surface was adopted.

Many of the streets, as shown by survey, were graveled and highly crowned to facilitate run-off of rainwater. These streets had an excellent subgrade, being thoroughly compacted base rock. In general, this rock had been applied from year to year by the Street Department and consisted of graded material from 2½ inches to dust. Other streets had required laying a base course before further improvement was possible. In many cases it was found that added improvement was possible by removing bad intersections, laying culverts, and in some cases by re-aligning fences and pole lines to obtain additional width of roadway. Every effort was made to look as far ahead as possible.

SECOND-COURSE ROCK IN PLACE AND ROLLED PRIOR TO FINAL PENETRATION COAT OF ASPHALT AND TOP COURSE OF SCREENINGS
In the background the tractor and scarifier are preparing another street for paving

HUBER ROLLER AND MOHAWK HEATER, SHOWING THE FIRST, SECOND AND TOP COURSES OF ROCK, AND THE COMPACTED SUBGRADE IN THE FOREGROUND

Construction

On the streets that had been already graveled, a 2-inch cut was made with a scarifier, which broke up the cemented material and eliminated ruts and washboard conditions, without penetrating below the base. The roadway was then bladed to the sides with a 7-foot blade grader and Caterpillar Thirty tractor, and the gutters were shaped up where concrete gutters were not already in place. The loose material was then re-spread over the street and base rock added to bring low places up to the desired level. Water, which was readily obtainable from residences along the streets being improved, was used when necessary, and the subgrade was then thoroughly rolled with a Huber 5-ton, 3-wheel roller, with 18-inch rear wheels exerting a pressure of 225 pounds per square inch of surface.

After the subgrade was thoroughly compacted by rolling and showed an even profile, a first course of clean crushed rock, from 1½-inch to 1-inch in size, was spread to a depth of about 2½ inches and rolled until further compaction appeared impossible. This rock was then ready for the first application of hot asphalt.

Asphalt Application

A 95 per cent grade E asphalt was used throughout the work, the application being made under pressure with a Model T Mohawk Hotstuf asphalt heater. This machine had a storage capacity of about 100 gallons of asphalt, or two barrels, but owing to the design of the melting chamber, a very rapid heating action is obtained, and as many as 16 barrels of asphalt have been put through in one 8-hour day. A hand-operated gear pump was mounted on

THE FINAL RESULT, SHOWING THE EXCELLENT SURFACE OBTAINED AND THE SMOOTH, EVEN, LOW CROWN

the machine, and a flexible hose 15 feet in length and with metal cover terminated in a spray nozzle. The fuel used was kerosene, which was kept under pressure by a simple pump.

The base course was given a spray coat of hot asphalt at a temperature of 275 to 350 degrees. In this application the surface of the rock was well covered by about ¾-gallon per square yard.

Second Course of Rock

After the asphalt was applied to the first course of rock, the roadway was immediately covered with ¾-inch key rock, which was hauled to the job in a Ford 1-ton dump truck backed onto the grade as the spreading progressed. All spreading was done by hand. Efforts were made to thoroughly cover the grade with about 1 inch of this size material in an even layer. The roller was then used and the second course of rock brought to a smooth, even cross-section. Rolling is one of the most important operations in this type of surfacing, and thorough compaction must be obtained. Some hand spreading and brooming was done to get a proper finish to the work and to remove whatever fine material appeared on the surface.

Final Application of Asphalt and Screenings

The second course of rock, after rolling, was given a coat of hot Grade E asphalt through the Hotstuf heater and immediately completely covered with sharp, clean screenings, from ⅛-inch to ½-inch in size. This top course was evenly spread and rolled, until a hard, smooth surface was obtained. Where required, additional screenings were applied to cover any appearance of asphalt, and the following day the road was opened to traffic. On some stretches the superfluous screenings were broomed ahead and to the side of the roadway, but usually it was left as the roller completed it.

Labor Organization

The success of this work is in a measure more striking when the organization is noted. The crew consisted of the Superintendent of Streets, in charge, and six men. The program was laid out with this size crew in mind, and the progress was very satisfactory. The crew employed consisted of: one tractor operator, who also operated the roller; one truck driver, who attended to the loading of rock, etc.; two long-term men, who operated the asphalt heater, etc.; and two temporary laborers. The various members of the crew also did other work as required, including scarifying, blading, spreading and watering.

Equipment Used

The equipment consisted of: one Caterpillar Thirty tractor, one 7-foot blade grader, one 5-ton Huber, 4-cylinder motor roller, with smoothing blade attachment, one Model T Mohawk Hotstuf asphalt heater, with hand pressure spray pump, 100-gallon size, one scarifier, one 1-yard Ford dump truck.

Rate of Progress

It was found that the crew of six men using the equipment listed could lay approximately 2,000 square feet of completed pavement in an eight-hour day. This amounts to about 100 lineal feet of roadway 20 feet wide per day, allowing time spent in improving drainage structures, gutters, sidewalks, etc. The city now possesses the necessary equipment to take care of the subsequent maintenance work. By a continuous program, the pavement may be extended to such streets as show need for the higher type of surface, which will undoubtedly include most of the roads in the undeveloped sections of the town.

The most important construction features of this type of work are:

1. Careful preparation of subgrade to proper profile.
2. Use of clean, hard, crushed rock.
3. Thorough compaction with approved type of roller.
4. Satisfactory application of asphalt by proper type of asphalt heater and sprayer.
5. Complete covering of asphalt coatings.
6. Final compaction by further rolling.

Construction Costs

The average cost of this work was close to 4 cents per square foot of pavement completed. This figure agrees almost exactly with construction costs on similar work which was done with almost identical equipment, by the city of Auburn, California, in 1929, when about 4.5 miles of this type of street was laid.

Shall We Balance Budgets or Minds?

THE widespread assault on public budgets, despite the all-important function of wise governmental spending as a means of restoring the economic balance between production and consumption, is boldly counter-attacked in an editorial in the March issue of *Public Management*, the journal of the International City Managers' Association. One paragraph follows:

"What is needed in order to meet this popular cry to 'balance the budget' is a balanced public mind. Straight thinking is more necessary now than ever before and cannot come from minds changing with kaleidoscopic rapidity. Perhaps the most serious barrier to immediate improvement is the apparent tendency of those who until lately were 'big business men' to now substitute for clear-cut thinking a mere rearrangement of their personal prejudices which find expression in the catch-phrase of 'Balance the budget!' Like all slogans, it is pleasant to repeat; it will be unpleasant and perhaps impossible to accomplish so long as able-bodied men, heartsore and weary, are looking for work and women and children are hungry while government relief alone stands between them and utter hopelessness."

The same issue of the magazine contains a well-balanced statement on "Reducing the Cost of Local Government," which points out various sane and constructive ways of increasing governmental efficiency and working for the permanent improvement of public administration.

The Development of the Boston Airport

By WILLIAM P. LONG

Chairman, Park Department, Boston, Mass.

THE site of the Boston airport is in East Boston, at or near the easterly and northerly side of Jeffries Point. It is laid out on lands acquired by the Commonwealth of Massachusetts, formerly mud flats, over which the tide water of Boston Harbor flowed—an area of about 860 acres.

Primarily as a waterfront development, the Commonwealth decided to reclaim a portion of these flats at East Boston. To prevent the escape of any of the fill, the bulkheads were constructed well in advance of the placing of the fill. The material used as fill, largely clay with some silt and gravel, came partly from dredging operations in the harbor proper, some of which was dumped from scows on the flats and some dumped into receiving basins close by. In addition, material was excavated from the original bottom in the vicinity of the development, which, as well as the material dumped in the receiving basins, was rehandled by being pumped hydraulically into the enclosure formed by the bulkhead.

The last contract by the Commonwealth for filling this enclosed area was completed on December 24, 1923. The area filled by the Commonwealth above the high water line was about 140 acres, and the total area of upland, including some that had been acquired by taking, was about 150 acres. This was the nucleus of land around which the present airport was centered.

By a legislative act in 1922 the Division of Waterways and Public Lands of the Public Works Department of the Commonwealth was directed to construct an aircraft landing field on the newly made land and to lease it to the U. S. Government for not more than ten years at a rental of $1 per year, with the proviso that the free use of the field for the National Guard of this state and for commercial purposes should be permitted. The lease with the Federal Government was executed in 1922. To provide such a field, a contract was made that year for grading the northerly part of the area that had been filled and the approaches thereto and for surfacing these areas with soft coal cinders.

The original layout for the landing field was in the form of a "T," each leg of which was 1,500 feet long and 200 feet wide, having a crown in the center of the runway, and depressions 50 feet each side and parallel to the center line. Bordering the field, two steel hangars were erected by the U. S. Army and two by the Commonwealth for the use of the Massachusetts National Guard, each of which was 65 feet wide by 120 feet long. In 1927, for commercial purposes a hangar was erected by the Airport Development Co.

The contract for the construction of the original field was completed on August 29, 1923. Thereafter, under

AN AIR VIEW OF THE BOSTON MUNICIPAL AIRPORT BY THE 101st PHOTO SECTION, 26th DIVISION, AIR SERVICE, MASSACHUSETTS NATIONAL GUARD

APPROACH TO THE ADMINISTRATION BUILDING

various appropriations by the Commonwealth, grading and surfacing were continued, providing enlargement of the cindered area and increased length of runways. In 1927, the total area graded and covered with cinders was about 26 acres, and the maximum length of the runway about 1,600 feet.

Field First Used in 1923

The first airplane landed at the East Boston field on June 4, 1923. On their homeward flight, the World Air Flyers landed on the field, on September 6, 1924. The field was officially opened by the U. S. Government on September 8, 1923.

The total cost to the Commonwealth, of the East Boston development, has been nearly three million dollars, the details being as follows:

Land takings (116.4) acres	$724,788.81
Dredging and filling	1,765,333.01
Construction of bulkheads (9,387 lin. ft.)	347,971.17
Airplane field improvements	81,041.52
General improvements	22,356.43
Total	$2,941,490.94

Under the direction of the Department of Public Works of the Commonwealth, up to the year 1928 about $100,000 was spent in the construction of the flying field, including contributions by the city of Boston and private subscriptions of citizens.

The amount expended was contributed as follows:

Commonwealth of Massachusetts	$81,041.52
City of Boston (by Chap. 385, Acts of 1926)	10,065.00
Private contributions	10,784.00
Total	$101,890.52

THE MAIN ENTRANCE LOBBY OF THE ADMINISTRATION BUILDING

In addition, the Federal Government spent money in furnishing and erecting hangars and other buildings and in improvement of the landing field, and the city of Boston laid an 8-inch water main from Jeffries Point to the hangar location.

Airport Leased to the City

On August 10, 1928, the Commonwealth, through its Department of Public Works, executed a lease of the airport area and adjacent lands and flats to the city of Boston for a term of twenty years. The rental is at the rate of $1 per year for the first period of ten years, and for the second period of ten years is to be determined by a special commission.

The Park Department of the city of Boston has had the control and custody of the Boston airport since September, 1928, with authority to construct, improve, equip, supervise, manage and regulate its use. Airport construction and general management were at that time decided on as a municipal rather than a state function.

Improvements Instituted

The Park Department immediately prepared a general plan and outline of improvements necessary to increase the flying facilities. The existing runways were extended, other runways were built and the landing-field area surfaced and drained in 1928 and 1929. Additional water mains, sewers and surface drains were laid to meet the conditions required by the new layout. Sanitary buildings and a refreshment cottage were erected in order to give better service to the increasing numbers patronizing the improved airport.

New hangars located on the southerly and westerly sides of the field were built of brick and concrete, the finest type of construction, by private airplane companies. Lots 105 feet x 220 feet were leased to several companies at an annual rental of $1,000 a year. The Massachusetts National Guard and the United States Army hangars were moved from their old location to new locations along the westerly side of the new flying field in accordance with this Department's new layout for the enlarged field. Boundary roads, including edgestone and concrete sidewalks, were constructed in the rear of the new hangars.

An administration building of brick and concrete was constructed by the city at a cost of $250,000. It houses the city airport offices, a weather bureau, telegraph offices, an office for the State Supervisor of Aviation, pilots' quarters, sanitary rooms, quarters for immigration officials, two restaurants, a garage, a room for the press, and a public lounging and waiting room. This building, known as the Memorial Administration Building and Control Tower, was dedicated with befitting ceremonies on December 30, 1929.

Varied Improvements

The enlarged field was marked out by boundary lights and other markers in September, 1929. A new floodlight was installed along the northeasterly edge of the new field for the use of night flyers. During the year 1929 the landing area was further extended, surfaced and drained. More roadways were constructed of bituminous macadam and of bitulithic pavement on a concrete foundation.

Parking spaces for 1,000 motor cars, located on the opposite side of the roadway from the hangars, have been

constructed and surfaced with bituminous macadam. Airplane taxi areas and aprons outside of hangars have also been surfaced with bituminous macadam. For landscape effect, certain areas have been loamed, on which grass seed and flowering shrubs have been planted.

To keep the general public off the landing field, iron fences have been erected enclosing all hangar yards and buildings. All the old metal and other earlier types of hangar buildings owned by private companies have been removed from the old field and a new and up-to-date modern type of hangar design now prevails.

Just before the city started its program, the surfaced area that was considered safe enough on which to land an airplane covered about 26 acres. The largest runway at that time was 1,600 feet in length by 300 feet in width. The area surfaced, drained and made suitable for landing purposes today totals 151 acres, and the longest runway is 2,800 feet in length and 600 feet in width.

The amount of money appropriated by the city on the airport for development, extension and construction since 1928 is $2,075,000, of which $410,000 remains unexpended. The private airplane companies have expended on new hangars and other buildings at the airport since 1928 approximately one-half million dollars. Further extensions must be made to the present landing field.

Expansion in 1930-31

On July 14, 1930, an additional area totaling 100 acres was leased by the Commonwealth to the city for extension of the airport to the east. Specifications and plans were immediately prepared for the primary development of this area by hydraulic fill, since which time 1,904,355 cubic yards of material have been dredged and filled inside the bulkhead lines.

Other areas to the north now owned by the city and state are being developed for further extension of the airport in that direction, and considerable work in the nature of repairing the old bulkhead, building about 2,000 linear feet of new bulkhead and placing about 75,000 cubic yards of filling for a dike on the east side, in addition to 180,000 cubic yards of filling at bulkhead, show the extent to which this work has progressed.

Accessibility

The Boston airport's location is ideal, being on the waterfront and accessible to sea planes as well as land planes. It will be possible with the future extension of the airport to have the runways so located that all take-offs will be made over water, rather than over high buildings or other structures or over thickly settled sections of the city.

Upon completion of the vehicular tunnel between Boston and East Boston, which is now under construction, the traveling time between the airport and the Boston City Hall will be about eight minutes. The traveling time today by motor car is twenty minutes and by electric car through the existing tunnel about six minutes.

The airport is operated for the benefit of the United States Army, Massachusetts National Guard and commercial airplane companies doing transport, sales and service business, student flying instruction and local passenger-carrying business. It must be able to take care of all types and sizes of air and sea planes. It must be of sufficient area and surfaced and drained to function throughout the year.

THE TAXI AREA IN FRONT OF THE HANGARS, SHOWING THE FENCED AREA AT EACH HANGAR TO KEEP VISITORS OFF THE FIELD

The surface of the landing field is of soft coal cinders, rolled in place, and has worked out very well as a landing-field surface here in Boston. An asphaltic oil is supplied to the cinder surface to minimize the dust nuisance. A light asphaltic oil was used so as not to entirely seal the cinder surface of the flying field, thus allowing the surface water to percolate through to the perforated metal pipe drain lines.

Drainage

The existing flying field is a so-called all-way field. Aviators using the field are continually praising the surface of it on account of its quick drainage properties and compactness. It is drained by two types or systems of drainage. An area of about 25 acres is drained by sloping the cindered surface to the outer or waterfront boundaries. The other 40 acres is drained by catch-basins spaced in certain established low points of the field with connecting drains of perforated metal pipes. The metal pipe trenches have been filled with crushed stone and gravel.

The portion of the field that is drained not only on the surface but with open drains is in the general neighborhood of the hangars and is the portion more often used by the flyers. The larger area with installed drainage system has been dry and firm enough to land on every day during the year.

The snow problem at the airport is a minor one. During the past ten years it has never been found necessary, despite storm conditions, to do any extensive clearing, the location of the field being such that the snow is swept from its surface into the adjacent bay.

THE RECEPTION ROOM IN THE ADMINISTRATION BUILDING

Resurfacing Rough Pavements with Thin Layers of Bituminous Mixtures

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OWING to the great increase in the weight and volume of traffic over our highways within the last few years and, in some cases, to the antiquated design of pavement sections used, some of the older pavements have become worn or broken down to such an extent that they demand the attention of highway engineers. Many of the pavements, owing to wear or disintegration, are in such condition that light maintenance repairs fail to keep up with the destructive forces of traffic and weather. Many such pavements still have sufficient strength and value to make it uneconomical to tear them up and construct new ones. The maintaining of such surfaces to the proper smoothness and stability requires an entire resurfacing.

By this salvaging method, important advantages are derived: (1) the original investment in the old pavement is conserved; (2) resurfacing materials may be obtained at nominal cost, particularly at present prices; and (3) the operation may be completed with little or no interruption to traffic. This results in a pavement good for many years of satisfactory service, at a reasonable cost.

Bituminous mixtures lend themselves readily to the patching and resurfacing or modernizing of old pavement. The bituminous mixtures adhere readily to the old pavement, waterproof it, add a certain value as a shock absorber between the load and the base, and furnish also a durable non-skid surface. Such resurfacing can usually be done at a cost far below that of complete new construction.

Study the Pavement Carefully

Where such pavements exist, the maintenance engineer should carefully study the problem before deciding on the exact amount and type of such resurfacing:

1. He should ascertain the amount and kind of traffic that is using the particular section in question; also, estimate as nearly as possible the probable traffic that will use the road within the next few years, whether the road will carry mostly light vehicles or whether it will be subjected to heavy truck traffic.

2. He should investigate the stability of the present pavement which is to be used as a foundation for the new surface. If weak places, indicating poor drainage, bad sub-soil, etc., are found, they should be corrected, thoroughly drained, and patched out to the grade of the old pavement before any resurfacing is placed on it. The whole surface should be stabilized until it presents a fairly equal and adequate resistance to the loads that it will be subjected to.

If the old pavement shows sufficient strength to carry the load, a very light resurfacing may be used; if, however, the old pavement is weak, a thicker resurfacing course should be used, thereby adding the required bearing strength.

Patching

Irregularities in the old pavement should be patched out with a mixture of crushed aggregate and bituminous material, bringing the patched surface to the desired grade and cross-section. The resurfacing course should be of approximately uniform thickness over the entire section, to obtain the best results. The patching should be done by using crushed aggregate of a size comparable to the depth of the hole or depression to be patched. The aggregate should be mixed thoroughly with just sufficient tar or asphalt of the proper grade to insure the patch against ravel. Care should be taken that an excess of bituminous material is not used in such patching, since an excess, particularly when combined with smaller aggregate, is likely to cause pushing and shoving and, ultimately, a wavy surface.

In resurfacing with bituminous mixture, the size of crushed aggregate used in the mixture should be varied and be comparable with the depth of the course. If the resurfacing course is so constructed, added strength to the pavement will be directly proportional to the depth of the resurfacing.

Adding Strength by Resurfacing

Experience in Indiana has been that most of the old pavements to be resurfaced were not quite stout enough to carry the load, and it was necessary for us to add strength to the pavement by thickening the resurfacing course. We have resurfaced some small stretches with a very thin course, ¾-inch to 1 inch thick, but generally such resurfacing has not been very successful. Resurfacing 2 inches or more in thickness has proved more satisfactory.

Varied Binders

During the past ten years we have resurfaced stretches of old cement concrete, old brick laid on a compacted gravel foundation, old brick laid on a cement concrete foundation, old bituminous macadam, and old treated stone roads. We have used several types of bituminous mixtures in such resurfacing. In 1926 we resurfaced a portion of State Road 67 near Fort Benjamin Harrison, using several types of bituminous mixtures as an experiment. The part to be resurfaced was old cement concrete reinforced. This old pavement had broken down in many places, partially on account of faulty construction and partially because of excessive loads. All badly broken

places in the old concrete were removed and replaced with new cement concrete.

The first section was resurfaced with an emulsified asphalt mixture using crushed stone as aggregate on part and gravel aggregate for part. This resurfacing pushed and shoved and was not altogether satisfactory. However, I believe that if we had used a smaller per cent of bitumen in the mixture, we should have secured better results. Other roads have been resurfaced since then with emulsified asphalt mixture using a smaller per cent of bitumen, and they have stood up well.

The next section was resurfaced with bituminous concrete (hot-mix laid hot). The surface was given a light prime coat of emulsified asphalt. The bituminous concrete was spread on the road, raked, and rolled while hot. The average thickness of this course was 1½ inches. The surface was then given a squeegee coat of asphalt, cement, and sand. This hot mix was very similar to the old Topeka mix specifications. Owing to unusual irregularities in the old pavement and the fact that the mix could be worked only while hot, we were unable to get as smooth a riding surface as desired. This course did not add quite sufficient strength to the old pavement, and some trouble occurred due to base failures. However, a part of this course still presents a fair surface.

The next section of this road was resurfaced with Amiesite mixture (hot-mix laid cold). The old concrete surface was given a light prime coat of emulsified asphalt, and the Amiesite mixture was spread on the road approximately 1¾ inches in depth, raked, rolled, and opened to traffic. This resurfacing raveled and peeled off the old concrete shortly after opening the road to traffic. The company selling the material claimed we should not have placed a prime coat on the old pavement. At their expense, they removed the entire resurfacing course, cleaned the pavement thoroughly, furnished and spread new material approximately 2 inches in depth. This final course of Amiesite has lasted well and is in very good shape after six years of hard service with very little maintenance.

The next section of this road was resurfaced with a 3-inch course of bituminous macadam (penetration method). The old concrete surface was given a surface treatment with cut-back asphalt and a light amount of stone chips scattered over the freshly applied treatment. Stone, size No. 2, with the smaller sizes removed, was spread over the surface approximately 3½ inches in depth loose. Penetration asphalt was applied to the stone and the course rolled. Key stone in a small amount was added during the rolling. The surface was then given a treatment of liquid asphalt CB in the amount of approximately 0.3-gallon per square yard. Covering material, size No. 4 crushed aggregate, was evenly spread over the surface in the amount of approximately 15 pounds per square yard. The surface was again rolled and opened to traffic. This stretch is wearing particularly well to date.

The next stretch of road was resurfaced with a 3-inch penetration macadam with a ½-inch rock asphalt wearing course. The bituminous macadam was built very similar to that just described, except that the surface treatment was omitted and the rock asphalt used instead. This course has worn very well, except that, in the writer's opinion, it would have been much better if we had used a ¾-inch instead of a ½-inch rock asphalt wearing course and if the surface of the bituminous macadam had been closed tighter before the application of the rock asphalt.

The next stretch of road was resurfaced with rock asphalt 1 inch in thickness laid directly on the old concrete after it had been given a light prime coat of bituminous material. On this stretch we have experienced considerable difficulty due to base failures. The resurfacing course did not add much strength to the old pavement.

In 1929 the stretch resurfaced with emulsified asphalt, and part of the stretch resurfaced with bituminous concrete, were again resurfaced with our standard retread, placing it on top of the old resurfacing. The retread was laid approximately 2½ inches in thickness, using No. 2 stone and the mixed-in-place method, with liquid asphalt CB for cement. This stretch so resurfaced is in very good shape to date.

Other Projects Outlined

The old concrete surface on Road 9 north and south of Alexandria was failing very badly. In the fall of 1927 we resurfaced some 2½ miles north and 4½ miles south of Alexandria with a 3-inch bituminous macadam course and a ¾-inch rock asphalt wearing course. Where the old concrete had broken badly, it was patched with cement concrete prior to placing the resurfacing course. This resurfacing was constructed in the same manner as the bituminous macadam with rock asphalt wearing course section on Road 67, described above. The resurfacing has stood up very well, and the maintenance cost of the surface has been very small to date.

During 1932 we resurfaced some stretches of old brick and old bituminous macadam. On the brick section and parts of the macadam section bituminous coated aggregate with a rock asphalt wearing course was used. The old surface was given a treatment of emulsified bitumen in the amount of approximately 0.15-gallon per square yard, and bituminous coated aggregate (Pre-cote method) was then spread on the surface to an approximate depth of 2 inches. This bituminous coated aggregate was delivered to the old surface through stone spreader boxes, to gage the amount used, and was leveled mechanically by use of a planer drawn by a tractor, or by use of a Gledhill attachment on a 12-foot blade grader. Later the bituminous coated aggregate was thoroughly rolled, and a rock asphalt wearing course in the amount of approximately 70 pounds per square yard was placed thereon. The rock asphalt was shoveled onto the road between metal strips which gaged the exact depth of the course. The surface was thoroughly luted and smoothed and rolled once over with a 5-ton roller. It was then leveled mechanically with a long-base planer, rolled and opened to traffic. The resurfacing not only smoothed up an old surface that had become very rough and objectionable to traffic, but also added considerable strength and, in my opinion, presents a surface that will show very little maintenance cost for some time to come.

Resurfacing Bituminous Macadam

Some of the old bituminous macadam stretches were resurfaced using our specifications AHMC (hot-mix laid cold) spread to an approximate depth of 2 to 2½ inches with a ¾-inch rock asphalt wearing course. In this bituminous coated aggregate we used No. 34 stone for coarse

aggregate, and penetration asphalt as a bituminous material. The AHMC mixture was placed on the old surface without a prime coat. The mixture was delivered onto the surface from end-dump trucks, chaining the end-gate to gage the amount put on. This course was leveled with a 12-foot blade grader with a Gledhill attachment. A very smooth and uniform surface was produced. The AHMC was then thoroughly rolled and a rock asphalt wearing course placed on it, using the methods previously described. This method of resurfacing was very satisfactory. We leveled up the old base, added considerable strength to the old surface, and presented a smooth, non-skid surface for traffic. The cost of maintenance on this stretch of road should be very small for some time to come.

We resurfaced another stretch of bituminous macadam where it was necessary to reduce the crown and level up an old base that was adequate in strength, but very rough. In this resurfacing bituminous concrete AHMC was used. In the binder course No. 36 aggregate was used in the mixture. The binder course was spread thick on the edges and thinner toward the center of the roadway, reducing the crown and patching out the depressions. This binder course varied from 3½ inches to 1 inch in thickness. We used No. 6 aggregate in the mixture for a top course. This course was spread with a 12-foot blade grader with a Gledhill attachment and varied in thickness from practically nothing to ¾-inch. The top course patched out many of the smaller depressions not taken care of by the binder course. A prime coat is not necessary when using bituminous concrete AHMC. The last stretch described had ample strength in the old surface, but was very rough and was resurfaced primarily to smooth the surface rather than to add bearing strength. This work was all done under traffic, the traffic using one side of the road while resurfacing material was placed on the other. Traffic may be permitted on bituminous concrete AHMC immediately after it is rolled, without damaging it perceptibly.

Smoothing-up an Old Concrete Road

Another old stretch of badly worn cement concrete was resurfaced with bituminous coated aggregate (Pre-cote method). This resurfacing was approximately 2½ inches in thickness. The old concrete surface was given a prime coat of emulsified bitumen, using about 0.15-gallon per square yard. The binder course, using No. 34 crushed aggregate in the mixture, was spread at an average depth of about 1½ inches, leveled by use of a Gledhill attachment on a 12-foot blade grader, and rolled. A wearing course of bituminous coated aggregate was then placed, using No. 6 aggregate in the mixture, at the approximate depth of 1 inch, leveled by use of a Gledhill attachment and thoroughly compacted by rolling. A surface treatment was then applied, consisting of emulsified bitumen in the amount of about 0.25-gallon per square yard, and coarse sand was spread evenly over the surface. Tests of the bituminous coated aggregate used in the binder course show approximately 3½ per cent bitumen, and in the wearing course, 4½ to 5 per cent bitumen. We experienced some slight ravel in this section, but, as a whole, it presents a very good surface that should not cost excessively for continued maintenance.

Some three or four years ago an old brick section was resurfaced and widened with our standard retread approximately 2 inches in depth. The old brick surface was very rough and showed signs of weakness at many points. Further, the old road was high crowned, and it was necessary to vary the thickness of the retread to bring the finished surface to the proper cross-section. The retread surface, owing to variance in thickness, etc., was none too smooth, and during the past season this portion of road was again resurfaced, using approximately 110 pounds per square yard of bituminous coated aggregate, and finished with a very light application of rock asphalt as a wearing course. Crushed stone, size No. 46, was used in the bituminous coated aggregate. After the bituminous coated aggregate had been leveled, planed, and rolled, a thin coat of rock asphalt was spread evenly over the surface in the amount of about 12 to 15 pounds per square yard and then again rolled. The rock asphalt did not entirely cover the surface, many of the stones in the bituminous coated aggregate still showing. However, the rock asphalt served as a seal coat, helped to smooth the surface, and to provide a wear-resisting, non-skid surface that should require very little maintenance for several years. While this particular surface has not been in service long enough to draw definite conclusions, it is apparent that the addition of the small amount of rock asphalt makes a very good seal and, in all probability, will eliminate the necessity of subsequent surface treatments ordinarily required on retread or bituminous mix surfaces.

Costs

From data kept in the field on the costs of the various methods of resurfacing described above, we find the following: Resurfacing approximately 2 inches in depth, using bituminous coated aggregate (Pre-cote method) finished with a seal coat of emulsified asphalt and fine chips or sand, costs approximately 40 cents per square yard. The cost of resurfacing old brick and bituminous macadam, as described above, with a 2-inch binder course of bituminous coated aggregate or bituminous concrete and a ¾-inch rock asphalt wearing course, is approximately 30 to 35 cents per square yard for the binder course, and 35 to 45 cents per square yard for the wearing course, or a total of 65 to 80 cents per square yard. These costs vary some in different localities, owing to the proximity of local materials, or to freight rates. For the resurfacing described above, where only 100 to 110 pounds per square yard of bituminous coated aggregate was used as a binder course and 12 to 15 pounds per square yard of rock asphalt was used as a wearing course, the cost for the total resurfacing was a little under 30 cents per square yard.

Based on our resurfacing, the main points which must be carefully considered are:

1. The amount and kind of traffic that is to use the road.
2. The strength of the old pavement to be resurfaced.
3. The availability and cost of possible resurfacing materials.

With these items at hand, one can better design the proper section to be used in such resurfacing.

Many miles of pavement have been constructed within the past few years. When these pavements have worn to such an extent that maintenance costs begin to mount, it is economy to resurface them.

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The War on Mud Balls

Cause, Prevention, and Elimination of Mud-Ball Formation in Rapid Sand Filters

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IT is generally conceded that sand size is an important factor controlling mud deposit formation in filter beds. Fine sand, less than 0.4-mm diameter, is undesirable, for Armstrong[1] has shown that the floc particles form a mat at the surface of the bed and with increasing loss of head this mat binds the fine grains together into a compact mass. Upon applying wash water, this mass is broken into sizable particles which frequently fall through the expanded sand bed to the gravel layer, creating the beginning of a mud deposit. This material accumulates in the gravel region and is held tightly together by the gelatinous floc, building mounds and ridges which frequently extend above the sand bed itself.

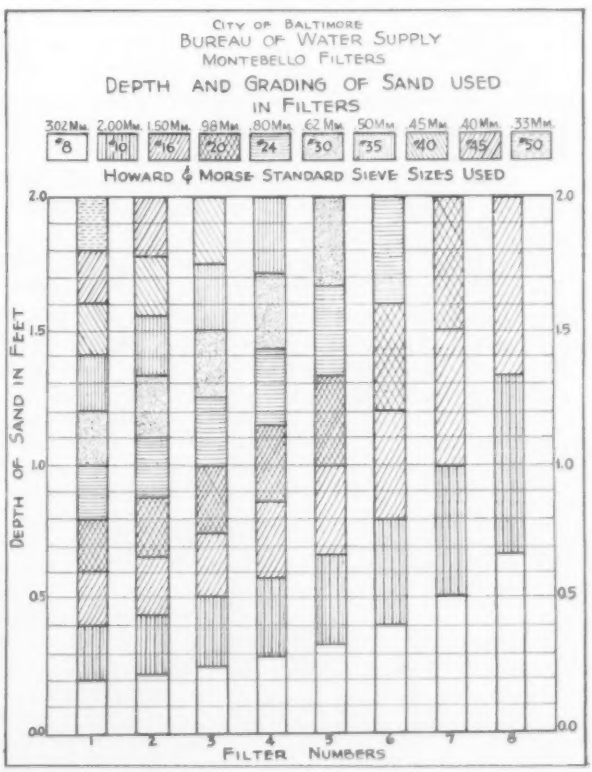
It is believed that if manganese is present in a supply, the hydrated manganous oxides formed by a coagulation of the floc, and retained in coated sand beds, serves as a binding agent, causing considerable compactness of the grains. Such sand is decidedly more adhesive than if coated by a normal colloidal film. Satisfactory washing of these beds is difficult, for the deposited material adheres to the sand grains even with high rates of wash-water application. When coarse sand is used, the floc penetrates the bed for a considerable depth and does not form a compact mass. This material is easily removed by washing, owing to the rubbing together of the sand grains, and does not form caked deposits, making possible a uniformly clean sand. The absence of accumulated mud deposits in the gravel layer reduces to a large degree the probability of mud deposit formation in the beds.

These facts suggest the importance of *knowing* the sand size sequence that is actually present in the filter beds. The effective size and uniformity coefficient values of a sand do not convey a definite picture of the particles as they are found in the bed. It must be realized that the top few inches of a filter serves as the filtering medium removing the greatest amount of the suspended material from the water. Therefore, the top sand size is the most important size and is the portion that should be considered as the *effective part* of the filter bed. With sand hydraulically graded by wash water, a diagram, suggested by James W. Armstrong, as shown herewith, presents a true picture of the filter bed as it appears when in service. A chart so constructed shows at a glance the varying depths of the sand sizes found in the bed. It is believed that if sand beds were more generally charted by similar diagrams, top sand sizes would be discovered to be of finer diameter than thought present.

Side Wall Cracks

Cracks in the bed are usually found associated with dirty filters. Recent work by Wallace, Hulbert and Feben[2] has demonstrated that slight shrinkage occurs in a *clean* sand bed after a few hours of service, due to rearrangement and compacting of the sand grains as the loss of head increases. This explains the presence of small side-wall cracks. From personal observation, it is apparent that where extended side-wall cracks appear, excessive shrinkage has been caused by the compacting of dirty sand grains. It is obvious that if settlement of a clean sand bed, under operating head, causes shrinkage to a slight degree, heavily floc-coated grains will compact to a greater extent. The organic colloidal coating contains a large portion of entrapped water which is squeezed out of the film by this pressure, producing a greater compacting and greater resultant shrinkage than with clean sand. This shrinkage is more or less in proportion to the thickness of the coating, giving extended openings[3] at the side walls, varying from one-half to one inch in width. Upon turning the filter out of service for washing, this pressure is released, causing the more or less adhering masses to fall into these cracks, resulting in a clogged area surrounding them. When the filter is washed, these clogged areas are forced against the side wall, compacting to a greater degree the sand and entrapped material, finally producing a decided mud deposit.

The deposits often extend to the gravel layer, but slope outward from the filter walls and are impervious to water. Water entering the crack is retained and does not penetrate



into the filter bed. This is noted when such filters are washed; the water breaks through the sand surface surrounding the openings but does not pass through them, showing they are impervious to percolation when the filter is in service.

Filter Washing

A few years ago it was demonstrated[3] that efficient filter operation could be obtained by using a fairly high velocity wash and applying at this rate for a sufficient period to give a final low (75 ppm) wash-water turbidity. The rate adopted was the *highest compatible with plant design*, and the operating curves suggested that a 4-minute wash at 2.7 feet vertical rise or 20 gallons per square foot per minute was the most economical rate for the Baltimore plant. This procedure gave a uniform wash free from the personal judgment of the individual operator as to the cleanliness of the bed. Collection of turbidity samples at one-half minute intervals during the washing period will readily establish the minimum time of wash, giving a low final turbidity. The lowest turbidity obtainable with a reasonable period of wash, giving the longest filter runs, should be adopted as the standard. When the washing control procedure is utilized, the turbidity determination at one-half minute intervals should be checked weekly.

The investigation by Hulbert and Herring[4] proved conclusively that sand bed troubles are caused by coated sand grains, and that a high velocity wash would keep the beds clean, eliminating mud-deposit formation. They showed that heavily coated sand grains have a decidedly lower specific gravity than clean grains, thereby creating a simple test for the maintenance of clean beds. They also suggested a wash rate that would expand the sand bed to a height approximately 50 per cent above its surface when at rest.

The velocity of wash water necessary for this expansion produces scouring of the sand grains in all portions of the bed, thereby eliminating the formation of adhering coating. If a graded sand bed is so washed, it is apparent that the finer top sand is expanded so greatly that the grains do not rub together, and complete removal of adhering coating is not necessarily obtained. This velocity will cause rubbing of the coarser particles and, by the excessive expansion of the surface sand, permit easy removal of the dirty particles from the deep areas in the bed. It is believed that complete removal of floc from a graded bed can be obtained by applying the wash water in two stages. The first task is to clean the top fine sand. If a velocity of wash is applied sufficient to expand the bed 50 per cent, the areas of fine sand are much expanded and rubbing action by these grains does not take place. This procedure insufficiently cleans top sand. An initial wash velocity should therefore be used that only slightly expands the top portion of the bed and produces rubbing action with the sand grains. After the top portion has been cleaned, as determined by the wash-water turbidity, the maximum rate should then be applied to expand the bed. This will cause the coarser grains in the deeper areas to rub together, removing coated material. Ample space is also provided in the top portions of the bed to assure unobstructed flow of the loosened particles from it.

A practical demonstration of this type of washing was conducted at Montebello. Two regular filters of 1,440 square feet area operating at 4 mgd rate were utilized for a period of six weeks, giving eleven sets of filter runs. One filter, No. 4, was washed until clean in the customary manner, using a vertical rise of 2.4 feet per minute. The other, No. 7, was washed at 1.2 feet vertical rise per minute until the wash-water turbidity was 75 ppm or less, and then the rate was increased to 2.2 feet vertical rise per minute until the filter was clean. The runs were stopped when the rate of flow decreased to the 0.5 mgd rate. Clean sand beds were not used for the test, since there were a few ridges of mud deposits along the walls in both beds. The temperature change during this period ranged from 47°F. to 58°F.

As shown in Table 1, increased filter runs of 37 per cent were obtained by using the variable rate of wash-water application. This fact indicates clearly its value for plant operation. The advantage of cleaning the smaller top sand by scouring with a low wash rate, 1.16 feet vertical rise per minute, then expanding this portion of the bed and simultaneously cleaning the larger sand grains, giving ample flow for the wash water, is apparent. The short experimental period of operation made it impossible to note any decided change in the mud deposits originally present. It is indicated, however, that deposited material was not excessively retained in No. 7 filter since the initial loss of head did not increase during the test. The increased filter runs justify this procedure, and if over a period of time it is found that the existing mud deposits are reduced or retarded in size, it will give additional value to this theory.

An easy method for observing mud-deposit formations over a period of time is to make a diagram of the filter unit. By spotting these formations, together with delayed washing areas, on such a chart and comparing the changes from time to time, valuable information may be obtained as to possible stoppage of the strainer system, distribution of wash water, and other erratic washing conditions. As a result of such comparisons, it is believed that if mud deposits are scattered through a filter bed, the strainer sys-

TABLE 1
FILTER WASHING DATA
(Average of 11 runs)

Filter Number	Depth of Bed (inches)	Specific Gravity of Sand (top 6")	% Coating	Details of Wash: Valve Partially Opened — Gallons Wash Water	Ft. Rise per Min.	% Bed Expanded	Initial Turbidity (ppm)	Min. Washed	Valve Opened Full — Ft. Rise per Min.	% Bed Expanded	Initial Turbidity (ppm)	Min. Washed	Hours in Service	Loss of Head: Initial	Final
4	20	2.632	2.5	106515					2.4	17.7	370	3.0	55.3	0.7	6[illegible]
7	23	2.604	6.5	106515	1.2	3.3	390	3.0	2.2	14.1	170	1.5	75.8	06.	6[illegible]

* Calculated from Hulbert and Herring's curve[5].

tem is partially choked. When found only along side walls, it is an indication of poor wash distribution in that area.

The Effect of Viscosity on Washing

It has been established that sand rise under pressure of wash water is controlled by temperature changes. The warmer water of summer gives a lower expansion than the colder water of winter, when the same velocity of wash water is applied. Therefore, if a definite per cent expansion of bed or vertical rise of sand is to be maintained, the wash-water valves must be opened wider in summer than in winter. Cox[2] has suggested that this condition is due to the change in viscosity of water at different temperatures. A consideration of the physical forces governing sedimentation of particles in liquids proves this to be correct as shown by an inspection of the Stokes law formula:

$$\text{Since } V = \frac{2\,r^2\,(p-p')\,g}{9\,n}$$

when V is the velocity of fall
r is radius of sand particle
p is density of sand particle
p′ is density of wash water
g is gravity constant, 32.2 ft. per sec.
n is viscosity of wash water

It is obvious that the density (p) and viscosity (n) of the wash water are the only variables affecting the buoyancy of the sand with change in temperature. Assuming a normal temperature range varying from 32°F in the winter to 75°F in the summer, inspection of physical constants discloses that the density of water decreases about 0.25 per cent and the viscosity 50 per cent with this seasonal change.[3]

Lawrence[7], describing the operating experience at the Baldwin plant in Cleveland, using 0.4-mm sand with a wash rate giving 50 per cent bed expansion, found it necessary to change the velocity of wash water from 24-inch to 36-inch vertical rise per minute with increasing temperatures. Utilizing Lawrence's data and substituting these

TABLE 2
EFFECT OF VISCOSITY ON WASH-WATER RATES

°F	V* Stokes Formula	Rate Wash Water (Cu. Ft./Min.)	% Increase with Temperature V	% Increase with Temperature Wash Water Rate
33-42	21.22	2.0	—	—
42-52	25.19	2.3	18.7	15.0
52-62	29.53	2.7	39.1	35.0
62-75	35.77	3.0	59.1	50.0

* Rate of settling, ft./sec. under influence of gravity.

values in the Stokes' law formula as shown in Table 2, it is apparent that an increased velocity of wash water is necessary to overcome the acceleration of gravity to give a definite sand rise with decreasing viscosity. As shown in the last column of this table, the increase in velocity is relatively equal to the rate of settling. This proves conclusively that the loss of buoyancy due to the decrease in viscosity of the wash water is compensated by the increase in velocity of the applied water.

When these conditions are noted, it is obvious that if wash-water valves are operated at a *fixed* rate both summer and winter, greater wash efficiency and increased sand rise are obtained with the colder water, proving the inadequacy of such procedure. This factor, together with increased thickness of sand-grain coating, readily explains the appearance of mud deposits in the summer season and their reduction or absence in the winter. The increased sand rise during the winter period maintains cleaner beds.

Sand Cleaning

Where mud balls exist, the beds may be cleaned by the use of caustic soda solutions, applying about one pound per square foot of bed and allowing it to stand for about three days with periodic raking. Subsequent washing will produce clean beds. It is to be noted that the cold caustic solution has been in contact with the dirty sand for a considerable period, thereby loosening the gelatinous coating from it.

Various mechanical methods have also been suggested. The sand may be ejected through a mechanical device, or high lateral velocity surface wash may be applied by a side perforated pipe placed in the bed at the time of washing, or the mud balls may be broken with a shovel or pole. Any of these methods are effective but usually expensive.

Summary

Summarizing the available information, it is believed that mud-deposit formation is caused by the compacting of dirty sand grains into masses due to the improper washing of the beds. This is particularly true when fine sand is used as a filtering medium. Utilization of sand at least 0.5-mm diameter, together with high velocity washing of the bed to give a 40-50 per cent expansion, if practical with existing plant design, will maintain clean beds free of mud deposits.

ACKNOWLEDGMENT.—From a paper presented before the Pennsylvania Water Works Operators' Association.

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[7] Lawrence, W. C., ibid., 22; 208 (1930).
[8] Wallace, W. M., Hulbert, Robert and Feben, Douglas, ibid., 23; 878 (1931).

High Tax-Paying Ability Preferable to Low Tax Levies

THE great problem is not how to reduce taxes, but how to enable the taxpayer to earn enough money so that he can pay his taxes. The problem cannot be solved . . . by indiscriminate slashing of public expenditures, stopping public improvements, and increasing unemployment and subsequent relief burdens which gradually dry up the taxable resources of our communities. . . . Public works and public utilities add to the wealth of the nation, the state, the community, not only by the resulting increase in values, but also by their intrinsic value, which adds to the comfort and well-being of its users and reduces their toil.

There can be no objections to issuing long-term bonds for public works when it is known that there is an immense amount of capital . . . lying idle in the banks. There certainly should not be any objections to such bond issues, if with their aid we can put men to work, create permanent values, stop unemployment, enable the taxpayer to pay his tax bill, and incidentally restore his buying power by which other industries will gain.

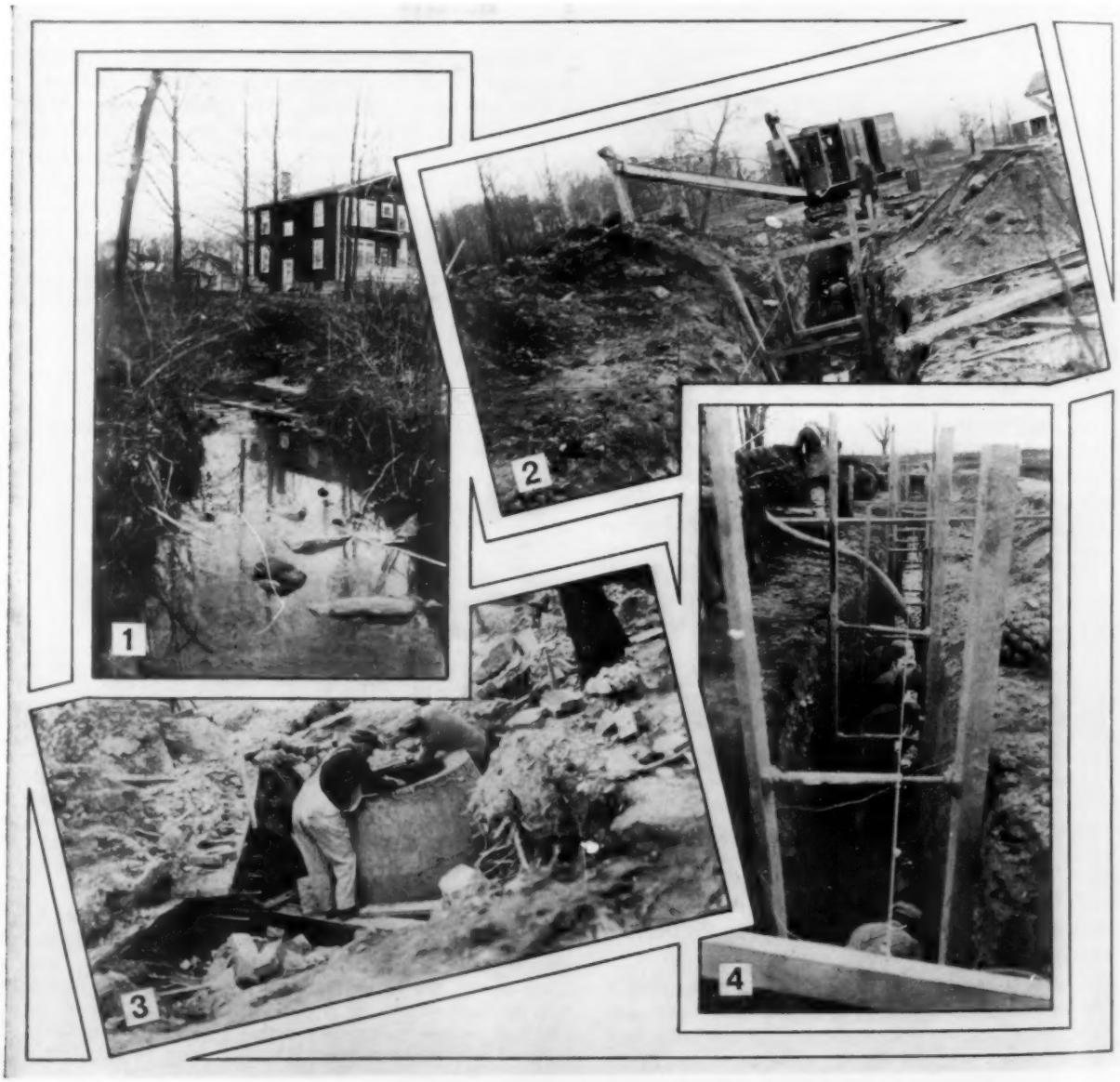
—From radio address February 16 by Arthur Noack, City Engineer of Garfield, N. J., and President of the New Jersey State Association of Professional Engineers and Land Surveyors.

Novel Sewer Financing

County-Funded Construction for an Unincorporated Community

IN 1929 the State Legislature of Delaware passed a bill permitting the county of New Castle to finance sewer construction in unsewered unincorporated communities within the county. This financing has been done from county tax funds and then is refunded to the county from the assessments, payable on connection to sewer.

In Claymont, an unincorporated community near the Pennsylvania line in Delaware, the two ends of the community were well taken care of by private sewers, but the section between permitted the domestic sewage to run into septic tanks, which eventually overflowed into a small creek, creating a nuisance, particularly in summer. A group of citizens in this section appealed to the Levy Court in accordance with the legislation, and their appeal was allowed. The county set aside the necessary funds for the work, and the County Engineer was instructed to prepare plans and award a contract for the work. The county will be repaid from assessments on a front-foot basis collectible when the property is connected to the system. A deferred payment plan is now before the General Assembly.



SEWER CONSTRUCTION IN CLAYMONT, DEL.

1. The small, badly polluted creek which created a nuisance in summer and which was cleaned up by the new sewers. 2. An Osgood shovel removing top soil from the trench while drilling went on close behind. 3. Starting the initial manhole. 4. Hand excavation of a deep trench on Glen View Avenue

The system laid out and under contract consists of 10,000 feet of sewer of 8-, 10-, and 12-inch vitrified clay pipe, the 12-inch size being used for the trunk line from the Philadelphia Pike to the Delaware River, a distance of 2,600 feet. Eventually an outfall sewer has been constructed about 300 feet into the river, to distribute the sewage in the stream.

Construction

The contract for the construction was awarded to George & Lynch, of Dover, Del. The excavation is mostly in rock and clay, with trenches running from 4 to 12 feet deep. On the trunk line in the fields an Osgood trench shovel was used, but most of the excavation along the Philadelphia Pike where traffic is heavy was done by hand. Numerous connections for gas, water, and electric and telephone conduits made the use of a trench excavator in this section impossible. The sewer line ran along the building line between the sidewalk and building.

Along the Pike there were other difficult problems where the sewer line had to be carried under an old storm-water culvert 10 feet wide by 4 feet deep. It was also necessary to carry a tunnel under the full width of the four-traffic-lane Pike so as not to tie up traffic.

In sections where rock was in abundance a Worthington Metalweld portable compressor was used to run the jackhammers, and then the trench was blasted with 50 per cent Atlas dynamite. The vitrified pipe were made up into double lengths on the bank with Sewer Seal, a bituminous joint compound, and then let into the trench with ropes, and the alternate joints made up in the trench. The joint material was heated in a portable Connery kettle.

There are 42 manholes in the line, varying in depth from 4 to 12 feet. These are all topped with Dougherty safety manhole covers to prevent rattling. The covers turn on and wedge slightly, so that passing traffic does not cause them to rattle. Trowelite cement was used for all the brickwork in the manholes in place of the specified cement mortar with 10 per cent lime.

The right-of-way for the trunk sewer was given by the Stockdale Corporation, owners of the development through which the trunk sewer passes, in return for the right to connect the existing private sewer to the line.

The work was done under the direction of Alban P. Shaw, County Engineer of Newcastle County, with John W. Alden as engineer in charge of the project.

Cost Accounting for Waste Collection and Street Cleaning

By PETER J. HURTGEN
Director of Public Works, Kenosha, Wis.

BECAUSE of the great burden placed upon municipalities in taking care of the unemployed and in balancing budgets left out of balance because of tax delinquencies, it is essential that the public works official have before him a picture of the cost of operating all the different activities of his various departments. From the experience in Kenosha with the accounting system installed by the Committee on Uniform Street and Sanitation Records, this picture is readily available, and its value can best be demonstrated by concrete examples.

In June, 1932, because of the large tax delinquencies and the rising cost of administering poor relief, it was found necessary to decrease salaries of city employees 15 per cent and reduce all budgets 22.24 per cent. I had the option of cutting those subdivisions of the budget which in my opinion would least affect service, keeping in mind that the cut must equal 22.24 per cent of the total public works budget.

Public Works Accounting System

The Public Works accounting system covers the following accounts:

Maintenance of Bridges
Maintenance of Docks and Breakwaters
Maintenance of Sewers and Drains
Maintenance of Roadways, Streets and Alleys
Service Department (City Garage and Blacksmith Shop)
Maintenance of Sidewalks and Crosswalks
Snow and Ice Removal
Street Cleaning
Street Sprinkling
Traffic Control
Waste Collection and Disposal
Weed Cutting

With the aid of the public works records, all the above items were analyzed and the budget balanced to conform with the 22.24 per cent reduction in about two hours' time. If these records had not been available, it probably would have required several days or even weeks to assemble the necessary data.

Waste Collection Units

Waste collection is effected in part by trailer collection augmented by truck collection. In 1931 a state law was passed providing that every trailer and semi-trailer having four wheels or more and weighing 2,000 pounds or more should be equipped with brakes to be operated with power from the driver's seat, or, if they could not be so operated, an adult attendant must be provided on each trailer or semi-trailer. This law became effective as of September 1, 1932. It was found that the trailer collection system was costing a trifle more than the truck system per cubic yard of garbage collected. This would be increased by installing brakes, which would have cost over $500 per trailer. It was therefore considered advisable to substitute trucks for the trailers and horses. It took only a few minutes in examining the records to provide this information.

Street Maintenance

The maintenance cost per mile and per square yard of the various types of pavements, based on the total mileage and total yardage for the year 1931 as taken from the cost records, is as follows:

Type of Pavement	Miles	Square Yards	Total Cost	Cost Per Mile	Cost per Square Yard
Sheet asphalt.....	38.15	716,070	$9,762.80	$225.90	1.2c
Brick	22.75	490,284	7,987.18	347.13	1.6c
Concrete	16.84	262,848	1,045.74	62.10	.4c
Asphalt concrete.....	13.46	214,108	1,906.27	141.62	.9c
	91.20				
Dirt, cinder and gravel streets..... ..	39.80	630,482	12,241.85	307.59	1.9c
	131.00				

From these figures it will be noted that the maintenance cost of the brick paved streets is considerably higher than that of other types of permanent pavements. This is accounted for by the fact that the brick pavements are in general considerably older and carry a heavier and greater volume of traffic than the other pavements. The other types are comparable in that they carry about the same amount of traffic and the average age is about the same. The general policy or standard of maintenance is the same on all streets, regardless of the type of pavement. It cannot be denied that these records are of great value and can be used as a basis for selecting future pavements.

Garbage Collection

Garbage collection and disposal, which represents a major item in the budget, at first thought appeared to be the one item whose cost could not be reduced without reducing the service. It was concluded that the service could not be reduced, which necessitated finding some other means of cost reduction. By careful examination of the records, it was discovered that the 1932 monthly record of cubic yards of garbage collected was materially less than in 1931. In 1931 the men were working 50 hours per week, and the records showed that, based on the 1932 monthly yardage up to June 1, the working hours necessary to collect that yardage could be reduced to 45 hours per week. With this reduction in hours a considerable saving was made in salaries.

Street Cleaning

Kenosha operates two motor-driven pick-up street sweepers that clean 93 miles of paved streets. Each unit is assigned to a district, the districts having about equal mileage. Each district is divided into sub-districts for each day's cleaning. The sweeper operator's record shows the daily mileage and the cubic yards of sweepings picked up in each district. It was found that in several of the sub-districts the cubic yardage of sweepings picked up daily was materially less than in others, and as there were no complaints from the districts from which the greatest yardage was picked up, the frequency of cleaning in districts that produced the least yardage was reduced, thereby decreasing the daily sweeping hours from nine to eight, which contributed materially in meeting the reduced budget without seriously affecting the street cleaning service.

Equipment Records

Equipment records furnish a cost per mile and cost per year per unit. From them it is possible to determine accurately when repairs and operating costs are so high that it would be more economical to purchase new equipment. The records also indicate the idle time of the equipment and in the matter of trucks may reveal that a rearrangement of schedule will enable the department to function efficiently with less equipment.

The city of Kenosha now operates nine different makes of trucks, and with the cost records of each unit available it is easy to convince the Council which truck not to purchase. The records also provide the Department with a valuable weapon of defense when insistent high-pressure salesmen attempt to convince an official of the merits of their particular equipment. With such information it is inexcusable to make the same mistake twice when purchasing equipment.

When the City Council requests information on costs, it is not necessary for the public works official to search the office for a scattered lot of papers to provide any information pertaining to the Department. Instead he can go straight to the files and secure the necessary data almost immediately.

ACKNOWLEDGMENT.—From a paper presented before the International Association of Public Works Officials.

Free Public Lectures on Regional and City Planning at New York University

AT the present time when municipal expenditures for even the most necessary public works are being subjected to careful and often destructive scrutiny by public officials and civic organizations, it is peculiarly opportune to consider the relation which wise planning for city and regional functioning and growth bears to fiscal policies. Rarely before have the general run of taxpayers been so alive to the necessity for improvements in public administration, not the least of which deal with the physical, social, and legal aspects of orderly and planned public works.

The individual city and town exist primarily to promote the health, convenience and comfort of their citizens. The cost of adopting and executing policies relating to city and regional planning is far less than the cost of *not* planning. A great part of the expenditures for public works in most large cities is due to re-planning to correct intolerable conditions that would have been avoided had a planning policy been adopted in earlier years. The College of Engineering at New York University has felt that it would be serving a public need to make available to the public a part of its activities in the promotion of sound city and regional planning. It is therefore sponsoring, in connection with one of its graduate courses, a series of ten free public lectures (some of them illustrated) given by nationally recognized experts in the several fields covered, thus offering an unusual opportunity to municipal and county officials, engineers, representatives of civic organizations and others. The lectures are given at 4:30 P. M. in room 808, Main Building, New York University, Washington Square.

The titles and dates of the remaining eight lectures are:

April 5, Special Problems in Traffic and Transportation, by E. P. Goodrich, Consulting Engineer; April 12, Community Building and Its Relation to Regional Development, by Clarence Stein, architect of Radburn (N. J.), and other developments; April 19, Sewage and Waste Disposal in Relation to Regional Planning, by George W. Fuller, Consulting Engineer; April 26, Water Supply in Relation to City and Regional Planning, by Malcolm Pirnie, Consulting Engineer, and President-elect, American Water Works Association; May 3, County Highway Planning, by Major C. W. Farny, Chairman, National County Roads Planning Commission; May 10, Legal Phases of City and Regional Planning, by Edward M. Bassett, Counsel, New York Regional Plan Association and New York Zoning Committee; May 17, Highway Improvements and the City Plan, by H. Eltinge Breed, Consulting Engineer, and Lecturer on Highway Engineering, New York University; May 24, The Regional Plan of New York and Its Execution, by H. M. Lewis, Consulting Engineer, and Engineer, New York Regional Plan Association.

FORWARD STEPS

Reported by
Municipal Officials, Chamber of Commerce Executives, and Others

A Strikingly Located and Efficiently Designed Municipal Auditorium and Exhibit Hall

LONG BEACH, CALIF.—The city of Long Beach has one of the finest beach improvements on the Pacific coast in its recently completed municipal auditorium, and concert and exhibit hall, and rainbow pier and breakwater, constructed under a $2,800,000 bond issue voted four years ago. The pier and breakwater are semi-circular, extending 1,400 feet into the sea between Pine and Linden Avenues. The auditorium and exhibit hall is built on a sand fill covering eight acres within a timber bulkhead inside the breakwater at the foot of American Avenue, thus being the majestic central feature in a great sea-water lagoon. The surrounding land has been transformed into a tropical garden spot. Around the third-floor level of the auditorium is an 18-foot promenade, commanding a fine view of the city, the adjacent beach and the harbor.

The auditorium is a large general-purpose entertainment and exhibition building. It is a steel and reinforced concrete fireproof structure, 172 feet wide and 390 feet deep, with the main front on Seaside Terrace, which is on a level with the fill in the bulkhead and the floor of the exhibit hall. The main auditorium is above the exhibit hall, and its main floor is on a level with Ocean Boulevard. with which it will ultimately be connected by a bridge extending out from the front of the building. For the present, access to the auditorium is provided by stairways at the corners leading to an esplanade in front of the structure over the exhibit hall and by wide ramps leading to the auditorium floor.

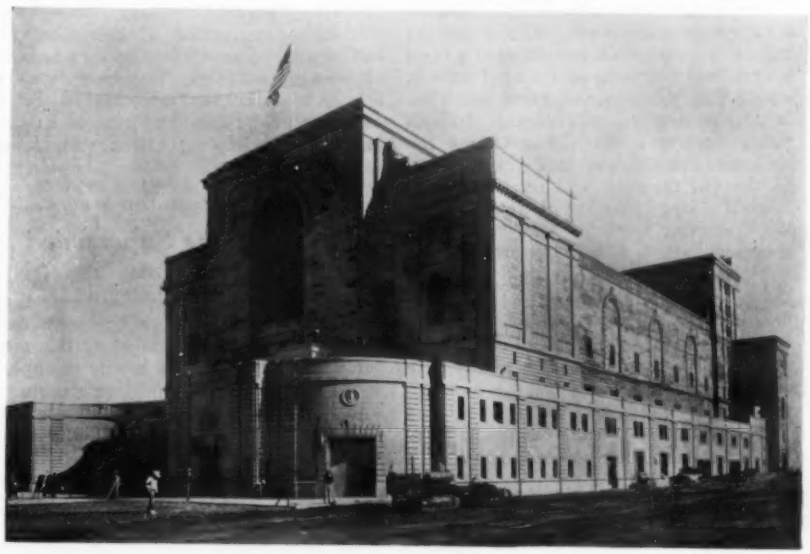
To meet the varied needs of the beach city, the auditorium was planned to serve different purposes. At the Seaside Boulevard end of the building the main auditorium has a level floor with removable seats for about 5,000, which can be used as an adjunct to the hall below or for dancing. At the ocean end of the building at the auditorium level there is a semi-circular concert hall in the shape of an amphitheater, seating 1,460. Between the two is a stage 90 feet wide and 38 feet deep, which can be used independently for either, or for both, of the rooms.

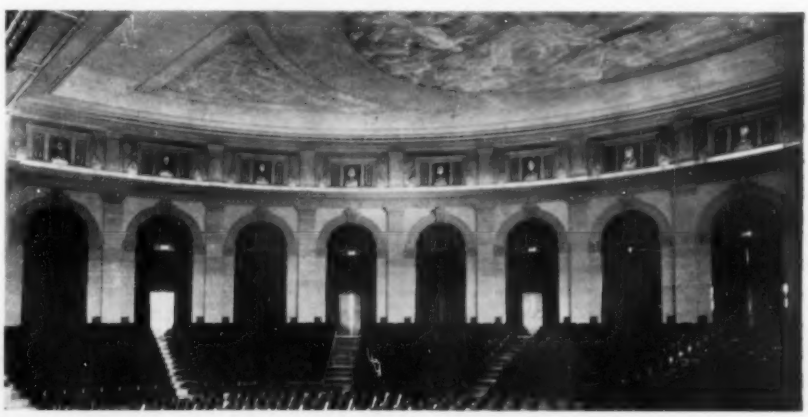
The stage is equipped for large productions. The proscenium opening on either side is 60 feet wide and 30 feet high, and the stage has a clear height of 65 feet under the gridiron. There are two sound-proof heavy asbestos curtains operated by hydraulic lifts. When the stage is being used with either room, one curtain forms the back wall of the stage. Both can be raised at the same time, throwing the two rooms together. There are no openings in the curtains, so that when one is down, the auditorium and the concert hall are entirely separate, and access from one to the other is only by going outside the building.

The building rests on 1,600 wooden piles averaging 40 feet in length, all cut off at 9 feet 6 inches below the top of the fill, or between 3 and 4 feet below mean low water. Over 1,200 tons of structural steel was used in the construction of the building, placed by means of two 100-foot steel guy derricks. The city decided to provide additional strengthening of the frame for the developing of earthquake resistance. This was effected by furnishing additional plates and angles at connections, and electrical welding around the riveted connections.

Steel plate girders 70 feet long over the exhibit hall support the floor of the main auditorium. Steel trusses with a span of 140 feet carry its roof. Supporting the south wall of the central front section of the building, which extends back over the auditorium, is a specially designed truss weighing 70 tons. The ceiling of the auditorium is slightly arched.

The placing of the 12,000 cubic yards of concrete for this building presented some rather unusual problems. All the concrete was mixed at a central plant. There was a central hoisting tower, and a runway located on the structural steel frame at the top of the balcony was used for transporting the concrete to the points where it was to be poured. It was chuted from the runway to floor hoppers, and buggies transported it along the slabs.





THE LONG BEACH MUNICIPAL AUDITORIUM

The upper photograph shows the building shortly after erection, with a Caterpillar tractor and scraper engaged in grading the surrounding area. Below appears a view of the interior of the concert hall. The front cover of this issue shows the completed building, grounds, lagoon and breakwater

There are practically four floor levels in the building, including a mezzanine on either side in the exhibition hall, with a clear floor space 102 feet wide and 227 feet long. There are two small convention halls, besides committee rooms and offices, on the mezzanine. On the same level there is a balcony seating 1,200 which overlooks the floor of the exhibit hall, for use when athletic contests are given.

The main auditorium is set back from the outer walls of the exhibit hall on either side, providing walks that lead directly from the esplanade in front to the concert hall in the rear. Ramps lead from the lobby of the exhibit hall to the main floor of the auditorium and also to the auditorium balcony. The orchestra pit in front of the auditorium stage can be covered when additional floor space is wanted. There are two elevators to the main auditorium floor.

The interior walls and ceilings of all the rooms are finished in acoustic plaster. The lobby and foyer of the auditorium have a coffered ceiling richly decorated, walls of sienna travertine with base of black and gold Montana marble, terrazzo floors, and heavily paneled oak doors. There is little ornamentation in the interior of the auditorium. The suspended ceiling is broken up into a series of panels by the lower sections of the roof trusses, giving the appearance of great arch ribs. In sharp contrast, the concert hall is richly decorated. In niches around the walls are bronze decorated plaster busts of the old masters, and on the ceiling there is a large painting of Orpheus with his lyre, the work of the Norwegian-American artist, Martin Syvertsen.

The building is heated and ventilated by six groups of fan-operated warm-air heating and ventilating systems, located at different points in the building. The stage and the stage dressing rooms have direct steam radiators. In the auditorium the air supply, with both supply and exhaust fans running, is about 30 cubic feet of air per minute per person for the entire seating capacity. To take care of smaller audiences, variable-speed motors have been provided to drive each fan at reduced speeds when necessary.

The auditorium has direct lighting from a central artificial skylight of 6,000 square feet, above which are suspended 90 300-watt Mazda lamps in individual mirror-lined reflectors. In the concert hall, in the molding, 8 feet below the ceiling, is concealed a continuous indirect lighting trough, with a ripple mirror-lined reflector. Three color circuits are provided, with 108 200-watt Mazda lamps per color. The cove also carries 2,700 watts in panic lighting, which is separately controlled from an emergency lighting bus at the main switchboard by a contactor operated from control buttons on the stage switchboard and in the ticket office. This circuit is also used for work-light purposes. The ceiling mural is uniformly lighted, and the seating area receives the softly diffused indirect illumination. With the clear lamps alone in service, the illumination level is 6 foot-candles.

The commission for the design of the auditorium was given to J. H. MacDowell, of New York. The resident architect was W. Horace Austin, of Long Beach, and the supervising engineer for Mr. Austin was Aaron J. Smith. Arthur H. Adams, Director of Public Service and City Engineer of Long Beach, handled the construction of the pier and auditorium. The undersigned acted as city's representative. The grounds were laid out under the direction of Peter Mohrbacker, Park Superintendent of Long Beach, in cooperation with Jesse Jackson, engineer.

J. H. DAVIES,
Structural Engineer, Long Beach, Calif.

Old Fire House Superseded by Modern Station

TWO RIVERS, WIS.—The fire house that served the old volunteer company and the present paid department of this city for more than 60 years has been superseded by a thoroughly modern structure. The old building was not only inadequate and antiquated, but was actually considered a fire hazard.

One feature of the new station is the combination hose and drill tower, having a height of 60 feet above the rear grade. As a hose-drying tower it permits 50-foot lengths of hose to hang freely from the top.

Another improvement consists of the automatically opening and closing doors, built in three sections and controlled by a hanging cord which the driver of a truck can reach from his seat. When the cord is pulled the doors open immediately, and close automatically after 45 seconds.

The station was designed by W. Fred Dolke, Jr., of Chicago. It has a frontage of 58 feet and a depth of 72 feet. The basement is constructed of poured concrete, as well as all exterior partitions and a few minor partitions. The interior of the basement is of tile and concrete, and contains a storage room, boiler room, coal room, base of tower, where hose used by the Street Department will be stored, and the electric service room.

The first floor, also entirely of concrete, consists of the big three lane apparatus room, supply room, hose room, alarm apparatus room (for future use), cleaning closet, private room or living quarters for the force, and the chief's office, bedroom, toilet and shower. In the general quarters the firemen have a lounge, dining room, kitchen, toilet room and closet.

A large dormitory takes up most of the second floor. It is equipped with two sliding poles in addition to one in the crew's recreation room. There are also an exercise room, locker room, toilet room with two showers, linen closet, another cleaning room and minor closets. Each member of the force has two lockers six feet in height, 18 inches wide and 21 inches deep.

Fire Chief Arthur J. Rahn, with his men and apparatus, took possession of the new headquarters in December, with opening ceremonies and a public inspection to celebrate the completion of this valuable public asset.

WALTER E. LAHEY,
Manager, The Two Rivers Reporter.

NEW FIRE HEADQUARTERS, TWO RIVERS, WIS.

Recreation and Education for the Unemployed

BOSTON, MASS.—Mayor James M. Curley of this city has arranged a comprehensive program for the benefit of the unemployed, providing reading rooms, gymnasiums, game rooms, and opportunity to attend lectures and participate in arts and crafts, choral singing, dramatics, and music. He states:

"Pioneer work for the mental relief of the unemployed was undertaken last winter in Boston through series of educational courses made possible by the cooperation of schools, colleges, and universities. The success of the 1932 cooperative university courses attracted nation-wide attention as well as creating a demand for its repetition here. This year Boston is going much further in this important service by providing, in addition to the free lecture courses at the Old South Meeting House, day and evening programs for physical and mental development in thirteen of the municipal buildings located strategically throughout the city. I am heartily in favor of this splendid project for recreation."

HARRY BELKNAP.

A Modern Form of Greek Theater

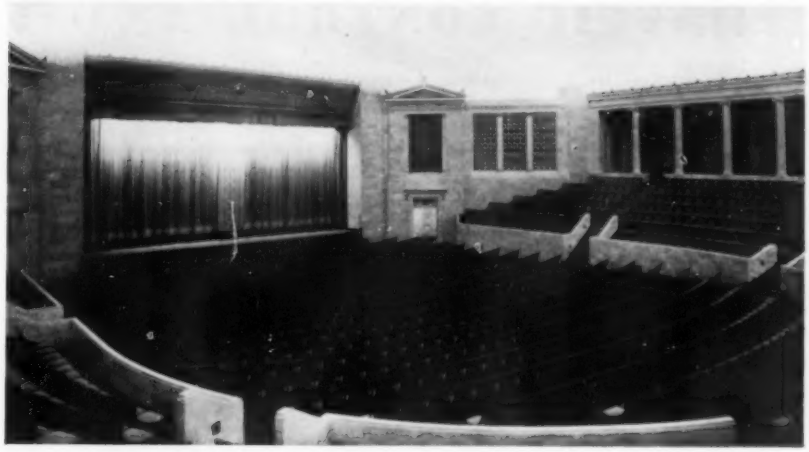
TOLEDO, OHIO.—When Leopold Stokowski conducted the Philadelphia Symphony Orchestra in concerts marking the formal opening of the greatly enlarged Toledo Museum of Art on January 10 and 11, his listeners were seated in a modern version of a classical open-air theater. Semi-circular tiers of seats surrounding the orchestra section of the concert hall, the topmost row surmounted by an Ionic colonnade; the majestic proscenium, giving upon a stage of generous dimensions; beautifully paneled marble walls enclosing the upper promenade—all are in the classic Greek spirit, harmonized completely with one of the most up-to-date museum edifices in the world. Completing the al fresco illusion is a gently domed ceiling upon which can be produced by an elaborate, concealed lighting system any effect from a bright equivalent of warm sunlight to the simulation of a night sky shimmering with moonlight.

The Peristyle, as this concert hall is designated officially, has 1,500 permanent seats—500 in the orchestra section and 1,000 on the tiers surrounding it—and provision has been made for 200 additional chairs on the upper promenade. The rows of seats are sufficiently separated to permit late arrivals to pass in front of adjacent seats without disturbing their occupants.

The Peristyle and its adjuncts occupy the entire east wing of the Museum, the exterior approach duplicating exactly the terrace, steps and columns which mark the front of the west wing and are balanced architecturally by the larger entrance to the central unit of the Museum building. Massive bronze doors admit the concert-goer to a vestibule with ticket windows on either side. From the vestibule one passes into a classical pronaos, or lobby, the architecture and decorations of which prepare the eye for the impressive beauty of the Peristyle immediately beyond it.

Seen through the opened doors of the pronaos is a vista suggestive of the theaters in which Greek drama reached its height. Curving majestically toward the proscenium is the stately sweep of the pillared promenade. Below are the tiers of seats, divided by six wide aisles, sloping gently down to the spacious orchestra section of the auditorium. Ahead is the stage, completely visible from every chair in the Peristyle, and above is the seemingly vast ceiling which the magic of electricity transforms into sky in a matter of seconds.

Marble stairways lead back from the promenade to upper levels, where are the broadcasting room; projection booth, in which talking picture equipment will be installed; rehearsal rooms and space occupied by ventilation equipment. Similar stairways lead to a lower promenade, from which there is ready access to rest rooms, the carriage entrance, stage entrance and elevator. Beneath the stage are an orchestra room, ample for a symphony organization; two chorus rooms and six dressing rooms.



THE PERISTYLE CONCERT HALL OF THE TOLEDO MUSEUM OF ART

The over-all size of the stage is 5,220 square feet; the proscenium is 50 feet wide and 25 feet high, the stage depth 45 feet. Equipment includes a cyclorama, upon which any desired lighting effect can be played; a pre-selective switchboard, with switch and dimming equipment for 70 different divisions of lighting; a disappearing footlight installation; the most modern devices for handling scenery; banks of overhead lights; spotlights and a motion picture screen with wiring facilities for talking picture amplifiers. Cork flooring, special treatment of the walls and the general form of the Peristyle contribute to make its acoustics of the finest. Thus, both eye and ear, as well as general comfort, are served with a maximum of efficiency.

The new additions to the Toledo Museum of Art are the gift of its founder, Edward Drummond Libbey, and Mrs. Libbey. The architects of the museum are Edward B. Green and Son, of Buffalo.

BLAKE-MORE GODWIN,
Director, Toledo Museum of Art.

Children "Play Safe" at Playgrounds

LOS ANGELES, CALIF.—A sharp decline in the number of auto accidents causing the death of children was noted here in 1932 and attributed to the aid of the playgrounds and schools, in a report on file with the Los Angeles Juvenile Research Council and made public by J. Paul Elliott, President of the city Playground and Recreation Commission.

Auto deaths among children of Los Angeles decreased 28 per cent in 1932 as compared with 1931, according to the report, which was submitted by E. B. Lefferts, head of the public safety department of the Auto Club of Southern California.

The reduction in child fatalities from traffic accidents was attributed to a campaign of safety education waged at municipal playgrounds and city schools, resulting in children themselves exercising greater care in crossing the streets and confining their play activities as much as possible to the public recreation centers.

City Manager Appointments

W. T. BRIDGES, Polk City, Fla., succeeding J. H. Addison, who had served a few months.

Arthur R. Boring, Plant City, Fla.

William F. Clark, Phoenix, Ariz., succeeding Jos. C. Furst, who had served since June, 1932.

G. W. Coleman, Tifton, Ga., succeeding R. E. Hall, who had served since 1922.

E. G. Gustafson, Fort Pierce, Fla., succeeding Mrs. May J. Priestley, who served during 1932.

E. Robert Helmrich, Melbourne, Fla., civil and chemical engineer, succeeding W. G. Vaughn.

Alexander C. Murry, Fall River, Mass., succeeding J. Walter Ackerman, who served during 1931 and 1932, resigning December 31.

H. R. Smith, Amarillo, Texas, January 15, succeeding C. H. Winterhaler, who had served since October 15, 1932.

Arthur A. Surber, Hollywood, Fla., formerly city treasurer.

The Municipal Bond Market

THE following is a representative list of recent sales of new issues of local bonds, taken from current numbers of *The Bond Buyer*. Bank moratoria and other aspects of the general financial situation retarded bond sales.

Amount	*City, County, etc.*	*Rate (%)*	*Term (Years)*	*Basis (%)*
$300,000	Reading, Pa.	4½	1-10 (ser.)	4.36
131,245	Lorain Co., Ohio	4½	3 (avg.)	4.47
135,000	North Kingstown, R. I.	4½	11¾ (avg.)	4.50
350,000	Onondaga Co., N. Y.	4¾	1-10 (ser.)	4.71
100,000	Stratford, Conn.	4¾	1-10 (ser.)	4.75
300,000	Minneapolis, Minn.	5	1-5 (ser.)	5.00
200,000	Springfield, Ohio	5½	13½ (ser.)	5.47
36,500	Fountain Hill, Pa.	4¼	21 (avg.)	5.90
61,486	Howard Co., Ind.	6	5 1/3 (avg.)	5.96
100,000	Gary, Ind.	6	10	6.00
132,000	Wayne Co., Ind.	6	5 (avg.)	6.00

TRAFFIC CONTROL AND FACILITATION

Conducted by Publications Committee, Institute of Traffic Engineers, 175 Fifth Ave., New York

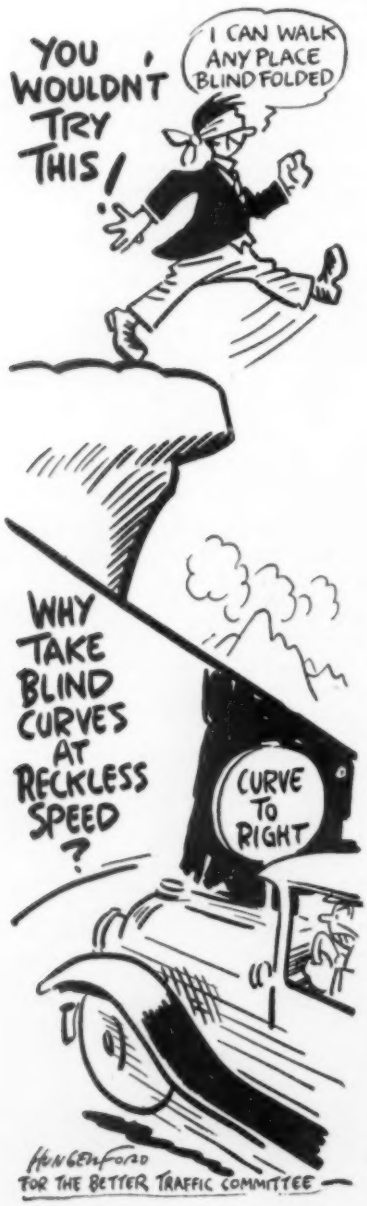
Maxwell Halsey, Chairman, Harry Hemmings, Reyburn Hoffman, Benoit Laberge, Theodore T. McCroskey, Donald M. McNeil, A. J. Naquin, Hawley S. Simpson, Arthur G. Straetz, Peter J. Stupka, Lawrence S. Tuttle, John C. Wrighton

Choosing America's Safest Cities

By SIDNEY J. WILLIAMS
Director, Public Safety Division, National Safety Council

WHICH American cities made the greatest progress in traffic safety during 1932, and why?

These were the questions which guided the committee of nationally known traffic experts when they recently designated the winners, in seven different population groups, in the National Traffic Safety Contest for 1932, which was sponsored by the National Safety Council and supported by many national and local civic organizations, and in which 442 American cities with a total population of approximately 30,000,000 had officially entered. The three judges were Dr. Miller McClintock, Director, Albert Russel Erskine Bureau for Street Traffic Research, Harvard University; Thomas H. MacDonald, Chief, U. S. Bureau of Public Roads; and Robert I. Catlin, Vice-President for Public Safety, National Safety Council.


YOU WOULDN'T TRY THIS!
I CAN WALK ANY PLACE BLINDFOLDED
WHY TAKE BLIND CURVES AT RECKLESS SPEED?
CURVE TO RIGHT
HUNGERFORD
FOR THE BETTER TRAFFIC COMMITTEE

Two Grand-Prize Winners

It was the original plan of the judges to select, from among these seven group winners, one city that could be awarded supreme honor as "America's Safest City for 1932." But they finally decided that *two* of these cities, in population groups so widely separated that their respective traffic problems could not be relatively compared, had achieved superior traffic safety results. Each city had carried through accident prevention activities most appropriate to a city of its size, and each had reduced its 1932 traffic death rates as compared to the previous year by about 30 per cent. This explains why two different cities—Pittsburgh and Evanston, Ill.—were awarded the grand prize.

In each of the seven population groups there was a close race for the first three places. And for each group the judges designated from three to twelve additional cities to be given honorable mention certificates of award. The full list of winners is given on page 68.

It is interesting to note that a majority of all cities which entered this nation-wide competition were able to reduce their 1932 motor death rates. And it is believed that this contest—the first of its kind ever held—had an important influence in bringing, in 1932, the first reduction in traffic accident fatalities in the United States since the coming of the automobile. This reduction was a drop in motor-vehicle fatalities from 33,740 in 1931 to an estimated total of 29,500 for 1932; and a drop of non-fatal motor-vehicle accidents from an estimated total of 1,000,000 in 1931 to an estimated 850,000 for 1932.

JUST A LITTLE HEART-TO-HEART TALK
GREEN TRAFFIC LIGHT
I REPRESENT SAFETY FOR THE PEDESTRIAN AS MUCH AS FOR YOU! GIVE THE WALKER A BREAK! DON'T TRY TO FRIGHTEN 'EM!

THE CARTOONS ON THIS PAGE WERE USED IN THE PITTSBURGH CAMPAIGN

The 1933 Contest

Because of the unusual popularity of the 1932 contest, and its remarkable success in starting scores of cities toward a successful solution of traffic problems, a follow-up second Annual National Traffic Safety Contest was started on January 1, 1933, under the same auspices. At the date of this writing nearly 250 cities, including nearly all the large American cities, have officially entered. Nearly three-fourths of these cities were in the 1932 contest. The population groups will be the same excepting that in Group 7 the lower limit will be raised from 1,000 population to 2,500. As a minor change of regulation, all cities will be required to submit monthly reports for all personal-injury motor-vehicle accidents, classified by age and type of accident.

The Grading Schedule

The standard of judging in the contest was such that no city was able to win either on a lucky traffic death record alone or through a "paper" program which produced no real results. The grading schedule, on the basis of 110 points as a perfect score, was:

1. Accident Record—including both the motor-vehicle death rate and the percentage of reduction in such death rate as compared with the average of three preceding years—50 points.
2. Accident Reporting—5 points.
3. Traffic Engineering—10 points.
4. Traffic Law Enforcement — 15 points.
5. Child Safety—10 points.
6. Public Education—10 points.
7. Community Safety Organization—10 points.

PITTSBURGH, PA.

The traffic safety program through which Pittsburgh achieved national honors was directed by Lewis W. McIntyre, City Traffic Engineer, closely cooperating with the Better Traffic Committee and the Western Pennsylvania Safety Council. This record was achieved in a city with a concentrated business district, with streets unusually steep and hazardous, and where weather conditions because of heavy fogs were frequently adverse to safe driving. As compared to the average for the previous three years, traffic-accident fatalities were reduced by 31.5 per cent, in spite of an increase of 6.4 per cent in traffic volume as compared to the three-year average. The work of the Better Traffic Committee began when this Citizen Advisory Committee was appointed in 1925 by the Mayor, followed shortly after by appointment of Burton W. Marsh as one of the first city traffic engineers in the United States.

The real engineering attack of the city traffic problems began through the analysis of accident reports in the fall of 1930. In January, 1932, an accident-analysis engineer was appointed, and in March of 1932 an ordinance requiring motorists to submit accident reports to the Bureau of Traffic Planning was passed. The Bureau received reports from motorists involved in personal-injury accidents and property-damage accidents exceeding $50. It received all pertinent police bureau reports; all reports from its district assembled by the State Bureau of Motor Vehicles; all street-railway accident reports; reports from taxicab companies; and it utilizes the reports of the County Coroner's Office. A monthly tabulation of all accident reports receives wide local distribution. An accident spot map is kept up monthly. A card record of drivers having accidents is kept and periodic checks of accident proneness are made and names of drivers having an unusual number of accidents are forwarded to the state for possible investigation and disciplinary action. Detailed studies are made of bad accident locations as they show up on the spot map. The city has been divided into districts, and each district is intensively studied from the standpoint of its accident record and existing hazards. Boy Scout groups of the city aid in traffic counts, and as many as 1,200 have been in service at once. Constant traffic equipment improvements are being installed.

Though not effective during 1932, the city has adopted an "Anti-Fix" tag for improved handling of traffic-law enforcement through records open for public inspection. Unique features in child safety education are talks before all schools by two traffic officers, highly organized school safety patrols, active safety committees in the city playgrounds, child-accident spot maps in schools, kept up to date from monthly reports; and an annual traffic essay contest participated in by over 80,000 public and parochial school children from 219 schools who were given cash prize awards totaling $2,625. One means of public safety education was a Vigilante Organization of 500 citizen reporters of traffic-law violations who call themselves "Traffic Safety Observers." They submitted during the year 4,874 individual reports. Two Inter-Fleet Drivers Safety Contests were conducted during the year, each of six months' duration, and the second contest showed a reduction of traffic accidents of 56.9 per cent as compared to the first.

* A limited number of copies of the Bureau's 1932 report are available.

ROCHESTER, N. Y.

As winner in the population group from 250,000 to 500,000, Rochester, N. Y., was able to capitalize during 1932 the continuous activity since 1914 of the Rochester Safety Council in a city-wide program to reduce accidents. "Anything that has been achieved in traffic safety," states Fremont Chester, Secretary, Rochester Safety Council, "has been because of cooperative efforts." Rochester has the lowest accident rate among all cities which reported to the National Safety Council in its population group, and reduced its traffic-accident fatalities from 48 in 1930 and 37 in 1931 to 32 in 1932. One novel feature in public safety education was detailed reports on "Traffic Tragedies for 1932" issued by the Statistical Committee.

A substantial portion of the yearly Council funds are used to reach children with safety lessons. The safety program of the Monroe High School of the city is considered one of the model programs among all secondary schools. In traffic-law enforcement 3,869 traffic summonses and arrests were made in 1932, and there were 3,773 convictions. One of the active efforts to improve driving conditions was through the delivery superintendents group which met monthly and conducted inter-fleet safe drivers contests and brought in experts to discuss problems relating to the safe operation of motor vehicles. A "Test Your Brakes Week" was held, and out of 25,758 cars that were voluntarily submitted to tests, 3,186 had their brakes corrected. A traffic-education month was conducted, and through a safety slogan contest 857 slogans were submitted. There were also public safety exhibits and other educational features to stimulate the city-wide program in traffic safety.

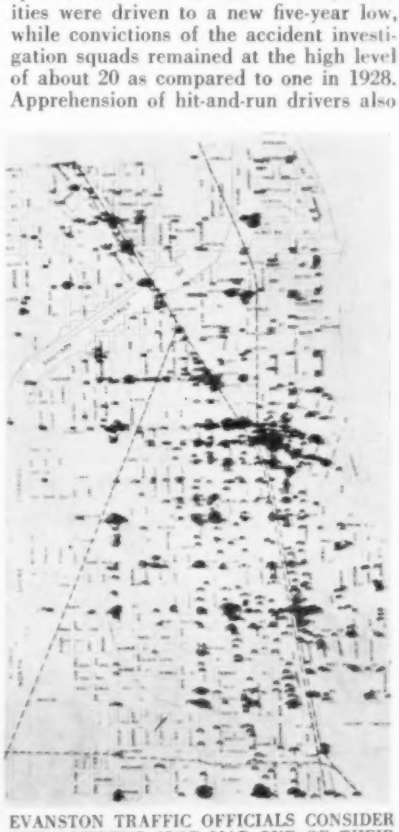
WICHITA, KANS.

The winner in the group of 100,000 to 250,000 population, Wichita, Kans., conducted its traffic-safety program through the Safety Committee of the Chamber of Commerce, with the cooperation of O. W. Wilson, Chief of Police, who has been one of the most active men in the country in the development and use of police department accident records. Through its program, Wichita was able to reduce traffic-accident fatalities from 27 in 1930 to 9 for 1931 and 9 for 1932. Three traffic-squad investigators, one in each detail, investigate all personal-injury accidents, and one sergeant devotes his time to Junior Traffic Patrols and educational work. One of the unique features in traffic law enforcement is the work of the Citizens Traffic Squad, with approximately forty members who are active every day in aiding the police to reduce traffic accidents. Forty-three Junior Traffic Patrol groups have been organized, and are rewarded during the summer by a safety patrol camp outing. Chief Wilson has been operating on the theory that speed is the greatest single factor in injury accidents, and during the year surveys were made at forty-four locations to determine critical speeds.

EVANSTON, ILL.

Winner in the group of 50,000 to 100,000 population, Evanston, Ill., has exceptional traffic problems because it is bounded by cities with much higher accident-fatality rates, and a considerable part of its traffic is by outside motor-vehicle operators. Frank M. Kreml, Director of the Bureau of Accident Prevention of the Department of Police, in submitting his report said:

"This contest has spurred the city of Evanston to its greatest year of safety accomplishments. . . . During 1932, the Traffic Division was reorganized under a lieutenant, thus placing this division on a par with others; the Model Ordinance was adopted, a city traffic engineer was appointed; a traffic commission was created; a city-wide traffic survey was conducted; the Evanston Safety Council revised its by-laws so as to permit of a more efficient operation—all under the spur of the contest. In addition, fatalities were driven to a new five-year low, while convictions of the accident investigation squads remained at the high level of about 20 as compared to one in 1928. Apprehension of hit-and-run drivers also



EVANSTON TRAFFIC OFFICIALS CONSIDER THE ACCIDENT SPOT MAP ONE OF THEIR BEST GUIDES IN TRAFFIC PLANNING AND ENFORCEMENT

Each spot represents an accident, a traffic failure. When the spots begin to accumulate at any point, a study is made to determine what conditions are responsible and what can be done to prevent the recurrence of such failures

continued on a high level. Under the new budget ordinance, all members of the Bureau of Accident Prevention have been made civil service, thus insuring the continuing administration of this work. There is now pending before the Police Committee an ordinance intended to eliminate the withdrawal of arrest tickets—all defendants so arrested being required to either pay a fine in cafeteria court or appear before the traffic judge."

Evanston has gained nation-wide fame through the work of its accident investigation squads, which has permitted a high degree of enforcement efficiency. For example, in 1932 there were 7,019 arrests; 5,507 were fined; 356 were nolle prossed; 973 were dismissed; 176 were pending; and 18 licenses were revoked for 90 days each. As to hit-and-run drivers, 128 cases were reported, 102 were apprehended, 52 were convicted, and 7 were pending. One novel feature in the public education program was a drivers' school among high school pupils, which proved so popular that enrolment was limited to 650 because of seating facilities, and the school will be repeated for 1933. Also a drivers' school for women, with five lessons of two hours each, was conducted.

DUBUQUE, IOWA

The traffic safety program of Dubuque, Iowa, winner in the group of 25,000 to 50,000 population, has been directed by C. E. Evans, City Manager. In 1931 and 1932 the local traffic ordinance was amended to conform as nearly as possible to the Model Ordinance. The city was divided into fifteen districts, and active safety supervisors were appointed in each, to cooperate with city organizations in the traffic safety program. A police office is in charge of schoolboy patrols, all police officers are instructed monthly in general safety activities, all accidents are reported, and in 1932, from 882 traffic summonses and arrests there were 642 convictions. During September the city carried on a traffic-law enforcement program which resulted in an increase of 530 per cent in convictions for traffic-law violations, and a decrease of 50 per cent in accidents. As a result of aroused new interest in safety activities, there has been organized a permanent chartered community safety council.

NORWOOD, MASS.

In the population group of 10,000 to 25,000, Norwood, Mass., had no fatal traffic accidents during 1932. The community traffic safety program has been directed by Town Manager C. A. Bingham. This has included safety instructions in all schools, the cooperation of civic and automobile clubs in public-safety education, and traffic-law enforcement which secured a large percentage of convictions. One of the chief activities has been weekly traffic safety inspections of the city by the City Manager, and the removal of hedges and fences, and other obstructions to the view of motorists, that were considered traffic hazards, and improvement in traffic signs. On slippery days all hills are sanded and also all intersections for a distance of 100 feet on each side of the traffic signals. The municipal truck fleet, entered in the state-wide truck contest, was the winning group for nine months out of the twelve. Special attention has been given to secure the best lighting at all intersections and dangerous corners. The traffic ordinances have been revised to meet the requirements of the national Uniform Traffic Code.

LA GRANGE PARK, ILL.

The safety record of La Grange Park, Ill., as the winner in the group under 10,000 population cannot be separated from the safety record of the adjoining larger city of La Grange, the second-place winner in the group of 10,000 to 25,000 population. The two places are distinct municipalities, but they cooperated in their traffic safety program, directed by John B. Gibson, President of the La Grange Civic Club, a group of about 400 citizens interested in all phases of community improvement. Since 1929, safety has been one of their most important activities. These cities are located in the geographical center of Cook County, which includes the city of Chicago, which has one of the highest accident rates among cities. La Grange is traversed by two important railways with three main tracks, and four trunk highways.

In 1929 La Grange itself had 168 traffic accidents, which very much alarmed the leaders in the Civic Club. The Model Traffic Ordinance was advocated and passed, and the Police Department became active in traffic-law enforcement. A traffic-accident investigating program, based on the Evanston plan and unique for communities of that size, was organized. Citizens became active in reporting and following-up traffic-law violations, and the town soon developed a reputation as a "fixless" town in law enforcement. For example, in 1932, there were 1,154 traffic arrests and 1,090 convictions, and practically all those discharged were persons with old licenses but with a receipt for a new license. Schoolboy safety patrols were replaced by adult crossing police, part-time employees under constant police supervision. During 1932 there was not a single traffic accident to school children. As a result of this organization and a continuous public-safety educational program, La Grange made the reduction from 168 traffic accidents in 1929 to only one traffic fatality in 1932, and La Grange Park had no traffic fatalities.

The list of winners follows:

Grand Prize
Pittsburgh, Pa.
Evanston, Ill.

Group I—Over 500,000 Population
1. Pittsburgh, Pa.
2. Milwaukee, Wis.
3. Detroit, Mich.

Honorable Mention

Cleveland, Ohio	Baltimore, Md.
Philadelphia, Pa.	St. Louis, Mo.
New York	

Group II—250,000-500,000 Population
1. Rochester, N. Y.
2. Newark, N. J.
3. Louisville, Ky.

Honorable Mention

Oakland, Calif.	Indianapolis, Ind.
Minneapolis, Minn.	Akron, Ohio
Seattle, Wash.	Kansas City, Mo.

Group III—100,000-250,000 Population
1. Wichita, Kans.
2. Peoria, Ill.
3. Grand Rapids, Mich.

Honorable Mention

Duluth, Minn.	Syracuse, N. Y.
Utica, N. Y.	Worcester, Mass.
Springfield, Mass.	Erie, Pa.
Flint, Mich.	Norfolk, Va.
Chattanooga, Tenn.	Wilmington, Del.
Lynn, Mass.	Richmond, Va.

Group IV—50,000-100,000 Population
1. Evanston, Ill.
2. Berkeley, Calif.
3. Brockton, Mass.

Honorable Mention

Holyoke, Mass.	Decatur, Ill.
Portland, Maine	Kenosha, Wis.
Oak Park, Ill.	Kalamazoo, Mich.
Manchester, N. H.	Lakewood, Ohio

Group V—25,000-50,000 Population
1. Dubuque, Iowa
2. East Providence, R. I.
3. Kearny, N. J.

Honorable Mention

Hackensack, N. J.	Montclair, N. J.

Group VI—10,000-25,000 Population
1. Norwood, Mass.
2. La Grange, Ill.
3. Mankato, Minn.

Honorable Mention

Fairhaven, Mass.	Ridgewood, N. J.
Rahway, N. J.	Klamath Falls, Ore.
Teaneck, N. J.	Roselle, N. J.
Bremerton, Wash.	Fort Scott, Kans.
Adrian, Mich.	Billings, Mont.

Group VII—Under 10,000 Population
1. La Grange Park, Ill.
2. Two Harbors, Minn.
3. Marblehead, Mass.

Honorable Mention

Menno, S. Dak.	Hudson, Mass.
Essex, Mass.	Concord, Mass.

Best State—Massachusetts
Second-Best States—Minnesota and New Jersey, tied.

Best in State

California—Berkeley	Mich.—Grand Rapids
Illinois—Evanston	Minnesota—Duluth
Iowa—Dubuque	New York—Rochester
Indiana—Indianapolis	New Jersey—Newark
Kansas—Wichita	Ohio—Cleveland
Massachusetts—Norwood	Penn.—Pittsburgh

Much of the success of the National Traffic Safety Contest has been due to its support by state and national organizations. The contest has been so successful, in inspiring new interest among cities in traffic safety and in aiding them to solve their traffic safety problems, that it seems likely to become an annual institution among American cities.

Second Municipal Radio Series in New York State

THE New York State Conference of Mayors and Other Municipal Officials, at the invitation of St. Lawrence University, Canton, N. Y., is sponsoring a new series of radio talks on problems of local government over the University's radio broadcasting station, WCAD. The talks occur at 12:30 p.m. Saturdays, and began March 11. Topics for April are:

1—Policing Rural Areas
8—Buying for a Municipality
15—Town Government
22—Problems of Village Government
29—What Changes Are Necessary in County Government

The talks continue through May. The Conference's other series, over WGY at 7:15 p.m. Saturdays, is also in progress.

Prepared by
FRANK B. WILLIAMS
Author of "The Law of City Planning and Zoning"

ZONING and PLANNING NOTES

From Data collected by the Zoning Committee of New York (233 Broadway)

Business District—Ice Plant

GEORGIA.—*Morris v. Lunsford*, 167 S. E. 297 (Supreme Court, November 21, 1932).—The Morrisses are owners of land in a residential district. Lunsford owns a tract of land about 200 feet from that of the Morrisses, diagonally opposite, and in a business district. Lunsford is erecting an ice plant on his land. Such an industry operates day and night; the machinery creates much noise, needs many operatives, uses chemicals, etc. The erection of such an ice plant in a residence district is contrary to the zoning ordinance, but Lunsford is petitioning the City Council to amend the ordinance so as to permit it. *Held* that the erection of the ice plant is unlawful.

EDITOR'S NOTE: This case illustrates the difference between the storage of ice, which is usually permissible in a business district, and its manufacture by machinery, usually by the use of ammonia and other chemicals, which is not, and should not be, allowed.

Zoning—Estoppel

MARYLAND.—*Lipsitz v. Parr* (Court of Appeals, February 15, 1933, reported in *Baltimore Daily Record*, February 20, 1933).—This is a proceeding to restrain the city from interfering with the erection of a building to manufacture ice, requiring machinery, the use of chemicals, etc. The building was to be located in a commercial district. The city zoning ordinance forbids the erection of such a plant in these districts. The plaintiff was proceeding under a permit, which has been revoked on the ground that it was issued by a clerk by mistake. The premises had been leased to a third party. The plaintiff claims that the city is estopped from revoking the permit.

Held that there is no such estoppel. The government was not acting in its proprietary capacity, pursuing a business for profit, but in a governmental capacity. The permit, being issued for construction in a district in which such construction was forbidden by the zoning ordinance—which is a valid ordinance—was illegal. The city is not estopped from revoking a void permit, issued by an employee in such a case, even if an innocent third party, relying upon the permit, is damaged.

Private Restrictions

MICHIGAN.—*Voorheis v. Powell*, 246 N. W. 154 (Supreme Court, January 3, 1933).—The fact that some lot owners in a subdivision have waived building-line restrictions does not prevent others from insisting upon them. Relief for violation of such restrictions, injurious to the person asking for it, will be granted even if there have been several breaches of them, unless these violations have subverted the original scheme of development and substantially changed the neighborhood.

NEW YORK.—*Seamans v. Gulf Refining Co.*, 237 App. Div. 202 (December 19, 1932).—The plaintiff purchased lots in a proposed high-class residential development. The purchase was made with reference to a map, duly recorded, showing many streets. The plaintiff has not built on her lots, and has at this time no occasion to travel over these streets; nor have others so built. The defendant has partially obstructed a cross street, shown on the map. The plaintiff claims an injunction against this obstruction. She does not claim damages.

Held that plaintiff is not entitled to an injunction at this time. What her rights may be in cross streets when she, and perhaps others whom she may wish to visit, have built on these streets, is not decided at this time. The plaintiff is left free to bring these question up when they arise.

EDITOR'S NOTE: Injunction is an equitable remedy, granted in the sound discretion of the court; and it is evident that the plaintiff is not at this time suffering any hardship for which she is entitled to such relief.

Boards of Appeals

MICHIGAN.—*Beardsley v. Evangelical Lutheran Bethlehem Church*, 246 N. W. 180 (Supreme Court, January 3, 1933).—The defendant is erecting a church contrary in some respects to the zoning ordinance for the district in which it is located. It appealed to the Board of Appeals on the ground that a literal compliance with the ordinance would cause practical difficulties or unnecessary hardship, asking for a variance of the ordinance for this reason. The Board granted the variance, and in its finding did not state the ground of its decision. *Held* that its decision was valid. The Michigan statute does not give any review, by certiorari, or otherwise, from such decisions, and therefore does not require the Board to state grounds.

EDITOR'S NOTE: The statutes of New York and a number of other states give the losing party the right to review the decisions of boards of appeals, and therefore require the board to state the basic facts upon which such decisions are made.

Garage—Park

NEW YORK.—*Village of Peekskill v. State Department of Public Works* (Supreme Court, Westchester County).—The village of Peekskill, in this action, asks for an injunction against the erection of a gasoline station upon the Bronx Parkway extension, which is a state park. The site of the station is within the village, in a residential district created by a village ordinance. The village claims that the construction of the station at this location is in violation of the zoning ordinance; but the state of New York is not barred by the local ordinance. The village also claims that the park authorities have no right to spend park money for this purpose, because it is not a park use; but such a garage is a great convenience to users of the parkway, and therefore incidental to its purpose.

EDITOR'S NOTE: On the reasoning of this case, filling stations could be erected in many parks. Fortunately, this is so contrary to public opinion that it will not occur.

The effect of zoning ordinances on public property has been commented on in earlier Notes.

Zoning Ordinance—Streets—Curb

NEW YORK.—*Matter of Cedar Ave. Realty Co., Inc. (Flynn)*, Supreme Court, Bronx County, reported in *New York Law Journal*, February 24, 1933).—The petitioner, granted a certificate of occupancy for a garage, asked for a permit, under a local ordinance, for a cut in the curb so that he could use it. *Held* that, under these circumstances at least, the use of the curb cut was not a violation of the Zoning Resolution.

EDITOR'S NOTE: The cutting of the curb is often asked for, among other purposes, to enable the owner of a vacant lot to use it for the temporary storage of automobiles. This is the first case which has come to my attention with regard to the relation of curb cuts and zoning.

Zoning—Earth Products—Map

NEW YORK.—*Cordts v. Hutton Co.*, 146 Misc. 10 (Supreme Court, November 9, 1932).—This is an action in which the plaintiffs seek to enjoin the defendants from removing sand and clay from certain properties in the city of Kingston, N. Y., and to prevent them from using these premises for purposes other than residential, to which they are consigned by two zoning ordinances of the city.

In the first ordinance, to identify the districts a zoning map was adopted on which it was attempted to mark out the boundaries of the various districts by colored sections drawn to scale. These sections were placed upon the map without reference to property lines or buildings and without surveys of any kind. The properties in question are shown to be within a residence district under this ordinance by measurements by scale. The defendants claim that this map did not reasonably locate these districts. The map was a part of the ordinance and furnished the only means by which the districts could be identified and their boundaries ascertained. The method used was to plot in upon a comparatively small map certain spaces in color to the scale of 800 feet to an inch, without regard to whether the division lines cut through dwelling houses and other buildings, industrial establishments and other properties. Evidence as to the division of other properties by this method was objected to, but the evidence was properly admitted, since such method affected the defendants' property in the same manner, the difference being only in degree.

With regard to this map the Court

ACTION

with the New A-C SPEED PATROL

Write for the Action Magazine

The Allis-Chalmers Speed Patrol

- Full Power Control
- More Horse-power
- Longer "Blade Base"
- Greater Blade Pressure
- Less Vibration
- Higher Working Speed

Smoother Maintenance at Lower Cost

ALLIS-CHALMERS

TRACTOR DIVISION—MILWAUKEE, U. S. A.

TRACK TYPE TRACTORS • ELEVATING GRADERS • TRACK TYPE WAGONS
POWER CONTROLLED GRADERS • MOTOR PATROL GRADERS • POWER UNITS
WAGON TRACKS • HAND CONTROLLED GRADERS • WHEEL TYPE TRACTORS

says: "Clearly such a method was haphazard, to say the least, and it may well be doubted whether it met the test required by statute." The decision, however, was made on other grounds. Under the facts of this case, fully given in the opinion, the Court holds that a method of division which separates the land from which the clay and sand is procured and the fabricating plant is not reasonable; and that the zoning of these properties solely for residential purposes, not reasonably suited for such use, not only constitutes a confiscation in violation of the constitutional guaranty, but is not made "with reasonable consideration, among other things, to the character of the district, its peculiar suitability for particular uses, the conservation of property values and the direction of building development, in accord with a well-developed plan," as required in the New York statute (Gen. City Law, Sec. 20, subd. 25).

Developing "Natural" Swimming Pools

By **MILTON SPIEGEL**
Of Brensley and Spiegel, Consulting Sanitary Engineers, Chicago, Ill.

THERE are natural swimming areas, such as lakes, rivers, tidal waters and ocean beaches, in which the consecutive dilution of the water, due to natural flow, wind, wave or tide action, aids in insuring purification of the water for the bathing load. In some cases the area must be enclosed by seawalls to secure the adequate distribution of a disinfectant agent.

There are also artificially constructed so-called "natural" swimming pools made to simulate a natural pond or lake and a surrounding sand beach: quarry holes fed by springs; artificial lakes; lagoons formed by the diversion of rivers or lakes; and abandoned water-supply reservoirs. Other artificially constructed "natural" pools are excavated out of the ground and have a sand-paved surface surounded by a sand beach.

A complete preliminary study of every swimming-pool project should be made by a qualified engineer to determine the type of development, "natural" or artificial, that has capacity for the maximum service to the community, with respect to the interdependent basic requirements of desirability, economy, and physical and sanitary control.

Desirability

Excluding large open beaches on a lake or ocean, a swimming area simulating the " Old Swimming Hole," having adequate provision for safety and sanitation, has a greater recreational value than various forms of strictly artificial pools. Depth control, a clean sand beach, a firm sand paving in the pool, sanitation, and a bathhouse, provide the natural pool with a great attraction and a feeling of security for the bathers. The landscaping should fit into the surrounding area so perfectly that the general public will assume that the pool was of natural origin.

The area for wading and swimming, up to 5 feet in depth, should be at least 40,000 square feet—about one acre. This provides for a maximum comfortable area of 2,000, not including the beach. The diving area should be much smaller, for only 15 to 25 per cent of the average crowd take part in this sport.

A sand bottom is more desirable than one of concrete; it feels more natural and comfortable. With a concrete paving it is necessary to fence off the sand beach, and to enforce showers prior to entering the pool, which of course detracts from the setting. The water in the sand-paved pool does not have the exceptional clarity of the water in the concrete pool, but it is usually clearer than the water in swimming areas on comparatively large lakes and rivers, especially so when a light-colored sand is used. In cases where the water is turbid upon entering the pool, a rough, inexpensive method of filtration may be warranted. In general, the clarity should be equal to, or better than, that of the waters of popular beaches on lakes.

The grading of the sand on the beach and in the pool, and the maintenance of cleanliness on the beach are important factors in determining the firmness of the pool bottom and the clarity of the water. The sand should be of such a coarseness as will allow only a small percentage of fines to become temporarily suspended in the water when the bottom is disturbed by wading. The beach should be raked and sprinkled at least once a day. Scum in the water, from dust and bathers, is readily removed by a scum gutter.

Dressing spaces, toilet rooms, hot and cold showers, means for checking cloths and valuables, and a first aid room, should be provided. Concrete floors are easily kept clean. The roofless dressing space is economical in construction and gives adequate ventilation. With large crowds, the central basket system of checking clothes is the most efficient. The use of hot showers and soap should be rightly enforced before entrance to the beach, followed by a cold shower to temper the swimmer to the water.

A concession stand for candy and other small eatables should be located outside the beach. A fenced enclosure may extend from the beach to the counter. All eating should be done within this area, so that the beach may be kept clean.

There should be adequate parking space. Facilities for picknicking, tennis courts, and baseball diamonds help to convert an easily accessible swimming area into a community recreation ground.

In general, where local conditions are amenable, it is estimated that a natural pool development can be built for one-half the cost of the equivalent concrete development. An important consideration is the accessibility of a suitable sand deposit, for the greater part of its cost is that of haul. The nature of the subgrade of the site is important in determining the cost of excavation. In the sand-paved natural development the shallow basin of the whole swimming area is supported by the earth out of which it is excavated. The method for obtaining depth in the diving area is variable. In the rectangular concrete pool the side walls have to be designed as retaining walls to resist the earth and water pressure.

A larger percentage of the cost of the natural pool construction is expended for direct labor—an important consideration as to economy, and as to the present opportunity for providing work for the unemployed by the construction of self-liquidating public works. It is possible to construct a natural pool by using unemployment relief labor.

Sanitation and Safety

Some of the conditions to be considered prior to the installation of a sanitation system for a pool are: the source of the water; possible sources of pollution; the degree of purity of the water as revealed by bacteriological and chemical tests; turbidity; and the existence of plant life in the water. Two methods by which most natural pools can be given adequate sanitary treatment are consecutive dilution and continuous disinfection of the pool water. Under certain conditions, as already stated, rough filtration or clarification will be necessary.

Consecutive dilution is accomplished by the circulation of fresh disinfected water throughout every square foot of the pool area, thus preventing dead spots of pollution. Continuous disinfection of the pool may be accomplished by the injection of a disinfecting agent into the circulation system. Chlorine or chloramine generally proves to be the most practical and economical disinfectant for water.

Adequate sanitation of a pool should be required, not only to safeguard the health of patrons, but also to maintain the desirability and popularity of the pool.

There should be no danger of drowning. It should be impossible to step off into deep water suddenly. The layout should be such that lifeguards can read-

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LOOKING NORTH AT THE DEEP SWIMMING AND DIVING AREA OF THE CLAY HOLE POOL, COOK COUNTY, ILL.
The bathhouse and the shallow swimming area in the background

ily control the swimmers in the various depths. Uniform slopes of 1 to 15 are recommended for the shallow portion of the swimming area up to the 6-foot depth.

The Clay Hole Swimming Development

Five miles south of Chicago is the controlled natural swimming area known as the Clay Hole Development of the Forest Preserve District of Cook County, accessible by automobile to 180,000 within a 5-mile radius. There is a quarry hole about 1,200 feet long and 200 to 300 feet wide, with 45-degree side slopes, and a maximum depth of 80 feet. It is filled by underground waters which travel through fine sand. The water is very clear and of good quality.

The swimming areas are separated by a concrete overflow dam: one, adjacent to the quarry hole, for wading and shallow-water swimming, 58,000 square feet, capacity 3,600 people, with bottom slopes of 1 foot at the curb to 5 feet at the center platform, paved with specially graded sand above a layer of crushed stone on the clay bottom; the other, the deep swimming area in a portion of the quarry hole, 16,800 square feet, capacity 600 people, sloping from 1 foot at the dam to 12 feet at the diving raft, paved with sand, and separated from the main body of water in the quarry hole by a float line. A concrete curb wall around the edge of the shallow pool contains insets for the circulation system nozzles and keeps the beach sand from being shoved into the water. The beach, 100 to 150 feet wide, is enclosed by a 6-foot fence. The entire area is floodlighted from standards on the fence line.

The bathhouse facilities carry out the recommendations made above. The parking space, for 350 cars, is made of pea gravel penetration macadam. All the control and mechanical equipment for the pool circulation system, the domestic water supply, and the lighting system is in the pump station on the beach.

A gravity corrugated iron intake line discharges the water from the quarry hole drawn from a point near the springs, into a wet well under the pump station. Ammonia is fed to the water before its discharge into the wet well. Chlorine is fed to the water through a connection on the suction side of the pump to insure good mixing. This water is then pumped through a manifold system to pipe lines leading to the swimming areas, and is distributed by specially designed nozzles around the curb wall, spaced at 50-foot centers. This circulation system is designed to keep every particle of water in the shallow area in circulation in the vertical and horizontal planes. The circulation of the water is in the form of a series of spirals which finally wind their way to the scum gutter on the overflow dam. The overflow from the shallow area is discharged through four corrugated iron pipes to the bottom of the deep swimming area on the opposite side of the dam. Pipes carrying fresh chlorinated water are connected to the overflow pipes in the dam. Rate-of-flow gages are connected to each of the main circulating lines for control purposes.

A 0.5-ppm residual of chloramine was maintained in the shallow area last season by a chlorine feed of about 1.3 ppm and an ammonia speed of about 0.4 ppm. Sanitary control of this water was based on conditions in the shallow area, owing to the greater number of people using this pool. It was impractical to maintain over a 0.2-ppm residual of chloramine in the deep area, owing to its connection with the main body of water. Residual tests in the shallow area showed that the distribution of the chloramine was very efficient. Surface, center and bottom samples from each of 35 control points on the shallow area showed the same residual throughout, repeatedly.

Samples for bacteriological analysis were taken as a check on the disinfection of the water:

For the shallow area, samples of 100-cc taken on 12 days during the season at various times of the day were positive for B. Coli in five 10-cc portions for one day; in two of five 10-cc portions for two days; in one of five 10-cc portions for two days; and were negative for B. Coli in five 10-cc portions for seven days. The total bacteria count on agar at 37 degrees C. after 24 hours showed a count of 2,100 per cc for one day and counts of less than 100 per cc for eleven days.

For the deep area, samples of 100-cc taken on seven days during the season at various times of the day were positive for B. Coli in three of the five 10-cc portions for two days; in two of five 10-cc portions for two days; in one of five 10-cc portions for two days; and were negative for B. Coli in five 10-cc portions for one day. The total bacteria count on agar at 37 degrees C. after 24 hours showed a count of 550 per cc for one day and counts of less than 100 per cc for six days.

The analyses were made in the laboratories of the City Health Department of Chicago. A period of about six hours elapsed between sampling and plating in the laboratories.

This development was designed and constructed in 1931 under the general supervision of The Board of Forest Preserve Commissioners, Emmett Whealan, President, Charles G. Sauers, General Superintendent of the Forest Preserve District of Cook County, and Charles C. Estes, Chief Construction Engineer. The author was responsible for the design of the swimming area sanitation and water-supply systems, and acted in an advisory capacity on the design of the layout and structural features. John Barstow Morrill had charge of the general landscaping. The engineering work was done wholly within the Engineering Department of the Forest Preserve District. The buildings were designed by Eric Hall, County Architect. The total construction cost was $116,145.

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THE CITY'S LEGAL RIGHTS AND DUTIES

Conducted by A. L. H. STREET, Attorney at Law

Annexation

Statute authorizing towns to annex territory held not to apply to territory in adjoining county (Kentucky Court of Appeals: *Town of Elsmere v. Tanner*, 53 S. W. 2d, 522).

Bonds

Bond act held applicable to bonds unissued when act was adopted, although they were previously provided for (Kentucky Court of Appeals: *Rohde v. City of Newport*, 55 S. W. 2d, 368).

Bribery

Receipt by alderman of money from employees and collection of funds to influence electors' vote on charter held violative of statutes (Massachusetts Supreme Judicial Court: *Commonwealth v. McCarthy*, 183 N. E. 495).

Business Regulations

Ordinance limiting auction sales of jewelry, etc., upheld (Indiana Supreme Court: *Gordon v. City of Indianapolis*, 183 N. E. 124).

City held empowered to provide for gasoline inspection (Utah Supreme Court: *Salt Lake City v. Bennion Gas & Oil Co.*, 15 Pac. 2d. 648).

Charity Solicitations

Ordinance regulating solicitation of funds for charities held void as vesting arbitrary powers in city manager (Michigan Supreme Court: *Hoyt Bros. v. City of Grand Rapids*, 245 N. W. 509).

Contracts

Borough held without right to award sewer construction contract under local hand labor at a higher price than bid for machine labor (Pennsylvania Court of Common Pleas, Luzerne County: *Perry v. Borough of Wyoming*, 24 Pa. Munic. Law Rep. 113).

Failure to sign sewer contract did not relieve city of liability to contractor, it having received benefits through the sewer construction; city must stand loss due to collapse of sewer due to city's faulty specifications; but entitled to offset cost of repairs due to contractor's fault (Michigan Supreme Court: *L. W. Kinnear, Inc., v. City of Lincoln Park*, 244 N. W. 463).

Plaintiffs held to have stated a cause of action for engineering services on a street improvement project under contract with defendant (Texas Court of Civil Appeals: *Fooshee & Hungerford v. City of Victoria*, 54 S. W. 2d, 220).

Delay held to bar complaint by prospective bidders for garbage removal contract that they were refused copy of bidding specifications (New Jersey Supreme Court: *Cunne v. Borough of Glen Ridge*, 163 Atl. 554).

Dams

City held not liable for dam's depreciation of nearby property values unless injury to property probable (Texas Court of Civil Appeals: *City of Waco v. Rook*, 55 S. W. 2d, 649).

Extra-Territorial Powers

Statute held to authorize city to impose license taxes on business conducted within three miles of corporate limits (Alabama Court of Appeals: *White v. City of Decatur*, 144 So. 872, 873).

City's jurisdiction over extra-territorial water-supply source held limited to protection against pollution (Louisiana Court of Appeal: *Dickson v. Hardy*, 144 So. 519).

Important Legal Decisions

involving municipalities, as reported in this department during 1931, are indexed and classified in The Municipal Index for the year 1932. This reference list, commencing on page 127 of the 1932 Index, supplements similar lists appearing in the 1931, 1930 and 1929 volumes, while the 1928 Index contains a list covering 1924 to 1927, inclusive.

Finances

Bondholder suing to compel payment of coupons held bound to prove sufficient funds available to satisfy all bondholders (Oregon Supreme Court: *Morris, Mather & Co. v. Port of Astoria*, 15 Pac. 2d, 385).

Bonds could not issue where part of proceedings specified 22 years as maturity and where subsequent proceedings specified 25 years (Ohio Supreme Court: *State v. Rees*, 183 N. E. 432).

Lack of authority to issue held only defense available against bonds in hands of bona fide holder (North Carolina Supreme Court: *Bankers' Trust Co. v. City of Statesville*, 166 S. E. 169).

Bonds could be made payable in lawful money although preliminary proceedings provided for payment in gold; bond proceeds held properly invested temporarily in other bonds (California District Court of Appeal: *City of San Diego v. Millan*, 16 Pac. 2d, 357).

City issuing invalid special assessment bonds held not liable to purchaser from contractor (United States Circuit Court of Appeals, Ninth Circuit: *Lumberman's Trust Co. v. Town of Ryegate*, 61 Fed. 2d, 14).

Proceeds of municipal utility sold held required to be used for reimbursement of taxpayers, if not used for purposes for which funds were borrowed for the utility (Oklahoma Supreme Court: *Protest of Reid*, 15 Pac. 2d, 995).

Public Utilities

Electric company held bound by ordinance fixing minimum rates for service by municipal and company's plants (Texas Court of Civil Appeals: *City of Farmersville v. Texas-Louisiana Power Co.*, 55 S. W. 2d, 195).

State commission's certificate of convenience necessity for electric light and power plant held not to abrogate necessity for company's obtaining municipal franchise (Missouri Supreme Court: *State v. City of Sikeston*, 53 N. W. 2d, 394).

Rule governing extension of water mains at instance of consumers, requiring deposit of cost, etc., upheld (Missouri Supreme Court: *State v. Public Service Commission*, 42 S. W. 2d, 349)

Special Assessments

Under "foot front" rule of assessment, depth of lot, number or character of improvements, or value thereof, is immaterial (Pennsylvania Supreme Court: *Borough of Berwick v. Smethers*, 160 Atl. 148).

Streets

Street-widening award to abutter held not reducible for benefits sustained by other property (Virginia Supreme Court of Appeals: *Talbot v. City of Norfolk*, 163 S. E. 100).

Taxation

State can tax gasoline used by municipalities, including home-rule cities (Colorado Supreme Court: *People v. City and County of Denver*, 10 Pac. 2d, 1106).

Taxicabs

Ordinance fixing maximum and minimum taxicab rates upheld (Ohio Supreme Court: *State v. Petrash*, 181 N. E. 814).

Street Meetings

Atheists' street meeting did not violate an ordinance forbidding public worship without permit (New York Court of Appeals: *People v. Smith*, 180 N. E. 891).

Water Supply

City held liable if it furnishes unwholesome water for domestic consumption (Montana Supreme Court: *Campbell v. City of Helena*, 16 Pac. 2d, 1).

City held to have superior right to divert river water, subject to certain navigation rights, etc. (Pennsylvania Supreme Court: *City of Philadelphia v. Philadelphia Suburban Water Co.*, 163 Atl. 297).

City held not liable for driving trespassing cattle from unfenced municipal watershed (Colorado Supreme Court: *Phillips v. City of Golden*, 14 Pac. 2d, 1013).

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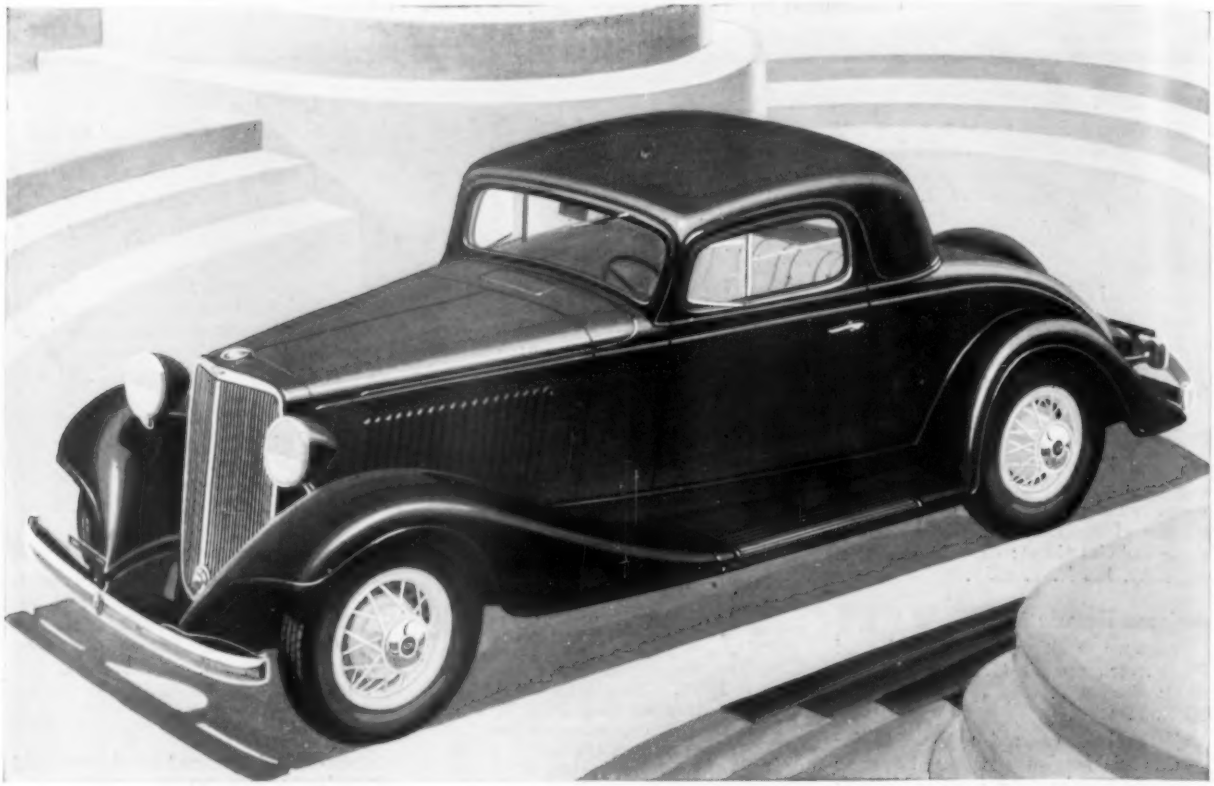

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American Cities

The Rise of the City—1878-1898.—*By Arthur Meier Schlesinger, Professor of History, Harvard University. The Macmillan Company, New York.* 1933. *XVI* + 494 *pp. Illustrated.* $4.00 *from* THE AMERICAN CITY.

This is Volume X in the series, "A History of American Life." Its scope is best indicated by the chapter titles: The Lure of the City; The New South; The Wild West Passes; The Populous States in 1890; The Wonders and Perils of the Metropolis; The New Woman; New Journalism; Influencing the American Mind; The Higher Learning; A Dime Novel; The World's Columbian Exposition; Horsemanship Delights All Classes; Protestant Christianity, Old and New; The Social Worker; "Two Kinds of Fool Americans"; The Blue and the Gray United. It will be evident from these headings that the emphasis is social. The vigorous, vivid style, the bringing back to memory events, habits, tendencies, that now, in this broad survey, become significant, give a thrill to the mature reader, who realizes with somewhat of a shock, "I, too, was a part of these things."

Local Government

Local Government in Many Lands.—By G. Montagu Harris, O.B.E., M. A., of the Middle Temple, Barrister-at-Law. P. S. King & Son Ltd., Orchard House, 14 Great Smith Street, Westminster, S.W.1, London, England. 1933. *X* + 409 *pp.* 15 *shillings.*

This is the second edition of a study of comparative local government by the Secretary for Great Britain to the International Union of Local Authorities. The material has been brought up to date, some chapters have been rewritten, and new chapters are included, one of these on Russia (U.S.S.R.). The South American countries are omitted on account of space limitations, and also Africa and Asia, except Japan, British South Africa, British India, and Turkey. One might well read the first and the last chapters before entering upon the individual studies. The unique Index is in tabular form, subjects reading across the page, with names of countries as column heads; cross-references are given in a separate list.

Social Welfare

Progressive Social Action.—By Edward T. Devine. The Macmillan Co., New York. 1933. *XII* + 225 *pp.* $1.75 *from* THE AMERICAN CITY.

The analysis which Dr. Devine has prepared as the Contents of his books reads, in sentence form, like a friendly talk, reasonable, convincing, covering the most important problems and the most compelling ideals of today. World citizenship; economic citizenship; the problems of poverty, disease, and crime; the present housing situation, and a social policy to meet it; social ideals—their historic origins and religious leadership by individuals and churches; and the obligations of religious citizenship; these are the main divisions of the author's discussion of a program of progressive social action, working steadily toward a rational, just and righteous order.

Libraries

In the February, 1933, issue of *New York Libraries* there is an article by Edward D. Greenman, Assistant Director, New York State Bureau of Municipal Information, on "The Public Library and the Public Official." The gist of the article is (1) the deplorable lack of assistance which the public libraries of New York State are giving to municipal officials, who are called upon to decide, at least once a year, on how much shall be appropriated for the support of the library; and (2) how assistance could be given. It is suggested that a possible way of stabilizing the income of the library is the earning power of the library as applied to the public official. 3 pp. (Apply to the magazine, at the University of the State of New York, Albany, N. Y.)

Public Works

The Federal Employment Stabilization Board (D. H. Sawyer, Director) of the U. S. Department of Commerce, has issued (1933) a 28-page quarto bulletin entitled "Advance Planning of Public Works in the District of Columbia." Washington has been chosen for this study as not materially different in its public improvements from other cities of moderate size. Its early history and its gradual growth are analyzed; also its government and fiscal affairs; and its typical trends, their application to advance planning and their use as a guide in determining the city's growth and expansion. The agencies engaged in planning in the District of Columbia, the methods, schedules and charts used are given. The Federal Employment Stabilization Act is quoted. 10c. (Apply to the Superintendent of Documents, Washington, D. C.)

Public Utility and Land Economics

Among the articles in the February, 1933, issue of *The Journal of Land and Public Utility Economics* are the following: "The Wholesale Electric Business in the Depression," by L. G. Cannon; "A Method for the Classification of Rural Lands for Assessment in Western North Dakota," by Charles E. Kellogg; "Some Unsolved Problems in High Building," by Herbert S. Swan; "Residential Electric Rates in Wisconsin," by E. W. Morehouse; "Expense and Capital Ratios of Wisconsin Electric, Gas, Telephone, and Water Utilities, 1927-1931," by Barclay J. Sickler; "Recent Trends in City and Country Populations," by W. Russell Tylor. $1.25 a copy. (Apply to the magazine, which is published quarterly by the Institute for Economic Research, 337 E. Chicago Ave., Chicago, Ill.)

City Planning—Billboards

"Final Report of the Special Commission Established to Study and Revise the Laws Relative to Zoning, Town Planning and the Regulation of Billboards and Other Advertising Devices" has been printed as House Document No. 1240 of the Commonwealth of Massachusetts, and forms a pamphlet of 185 pages. The Harvard School of City Planning put at the disposal of the Commission the results of extensive researches into existing legislation on city planning and zoning, made by Frank Backus Williams, Edward M. Bassett and Robert Whitten. The study in Part I includes state planning, regional planning, and municipal planning. Three recommended bills are presented in appendixes: (A) To Promote More Economical and Orderly Development of the Commonwealth through the Creation of an Unpaid State Planning Commission; (B) Providing an Improved Method of Municipal Planning; (C) Revising the Municipal Zoning Laws. Appendix D gives the report of Mr. Williams and his associates. Part II, on billboards, shows, in several statements of the Commission as a whole and of its members, the inability of a majority of the Commission to agree upon a disposition of the subject matter. (Apply to the Secretary of State, State House, Boston, Mass.)

Community Advertising

A booklet describing the commercial and industrial advantages of Wabash, Ind., has been prepared by that city, in the office of City Engineer J. H. Philpott. It is an attractive 36-page publication, which has been given a strategic distribution among manufacturers in Indiana and surrounding states. A mimeographed report on the community advertising campaign is also available. (Apply to the City Engineer.)

Wisconsin Cities

The League of Wisconsin Municipalities has compiled an 8-page mimeographed bulletin on "Group Problems of Wisconsin Cities and Villages," which is a factual summary of devices contrived to meet special situations. 25c. (Apply to the League, 114 N. Carroll St., Madison, Wis.)

Highways

The 1932 Annual Report of the Board of County Road Commissioners of Wayne (Detroit) County, Mich., opens with an account of the way in which the depression is being met in Wayne County road matters, under the heading, "Economical Adjustment of Road Finance." Many fine photographs illustrate the section on "Highway and Superhighway Construction, including several of bridges and grade separations. The report of the Wayne County Board of County Park Trustees for the 15 months, Sept. 1, 1931, to Nov. 30, 1932, inclusive, is incorporated in this pamphlet. Traffic control, roadside development, and comfort stations are presented as part of the broad work carried on. The county parks and parkways and the airport are also reported on. The financial reports of all the different divisions of the work are an important section. A folding road map of Wayne County is included. 96 pp. (Apply to the Board of County Road Commissioners, 3800 Barlum Tower, Cadillac Square, Detroit, Mich.)

Local Government Cost

"Reducing the Cost of Local Government" is a statement prepared for the guidance of public officials, research and civic agencies, taxpayers' organizations, and other interested persons and groups, by the secretariats of the American Municipal Association (Drexel Ave. and 58th St., Chicago, Ill.), Bureau of Public Personnel Administration (923 E. 60th St., Chicago), International City Managers' Association (same address as the Bureau), and Municipal Finance Officers' Association (850 E. 58th St., Chicago). March, 1933. 8 pp. In discussing the failure to distinguish between private and public business it is maintained that government is the recognized means of carrying on group activities cooperatively and should be readjusted to produce desired ends, and not boycotted by refusal to pay taxes and by the elimination of essential services. "The question demanding consideration is where, how, and by whom public expenditures are to be reduced." Procedures in effecting economy are explained, and the duty of citizen organization, the importance of the work of research agencies, and the responsibility of public officials, in constructive action for good government, are emphasized. 5c; 3c in lots of 10 or more. (Order from any of the four organizations mentioned above.)

City Economy

"Budget Making and Administration—With Special Reference to Cities"; "Constructive Economy in Local Government—A Guide for Study of the Means of Reducing Expenditures without Injury to Essential Services, Designed Primarily for Use in Connection with City Government but Adaptable to Other Units of Local Government"; these are two mimeographed pamphlets by Dorothy Leonard Judd, issued by the Department of Efficiency in Government, National League of Women Voters, 532 Seventeenth St., N.W., Washington, D. C. January, 1933. 27 and 17 pp., respectively. The form of the budget, its preparation, adoption, and execution supply the framework for the information and discussion in the first pamphlet. In the second, the League seeks, in its study of municipal economy, to develop public opinion "in support of those services the elimination or weakening of which would cause future problems of a magnitude quite out of proportion to the savings made for the time being." 10c each. (Apply to the League.)

Public Health Nursing

"Objectives and Qualifications in Public Health Nursing" is published in *Public Health Reports* for March 10, 1933, as a reprint from *Public Health Nursing.* 8 pp. The Objectives have been prepared, as a tentative statement, by the Committee on Field Studies and Administrative Practice of the National Organization for Public Health Nursing, and the Minimum Qualifications by the Committee on Education of the National Organization. 5c. (Apply to Superintendent of Documents, Washington, D. C.)

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Highway Transportation

A 36-page pamphlet contains Parts I and II of the recommendations of the Joint Committee of Railroad Executives and Highway Users (Jan. 30, 1933) on "Regulation and Taxation of Highway Transportation." Part I contains the recommendations; Part II contains a series of notes (referred to in Part I) explaining the differences where separate recommendations are made. "The public is entitled to the benefit of the most economical and efficient means of transportation by any instrumentalities of transportation which may be suited to such purpose, and no legislation should be enacted which has for its purpose the stifling of any legitimate form of transportation." (Apply to the Committee, Room 381, 380 Seventh Ave., New York.)

Child Health

The "Suggestions for 1933" for the observance of May Day—Child Health Day are published in a 30-page pamphlet issued by the American Child Health Association, 450 Seventh Ave., New York. Last year the Conference of State and Provincial Health Authorities of North America took over full responsibility for the observance of Child Health Day, which means that the leaders of May Day activities in the future will be the state health officers of the United States. The pamphlet gives brief statements of May Day activities in 1932, and a variety of suggestions for programs and publicity for the current year. (Apply to the Association.)

Juvenile Delinquency

Publication No. 215, "Facts About Juvenile Delinquency—Its Prevention and Treatment," has been prepared by the Children's Bureau of the U. S. Department of Labor "to present, in easily available form, something of the newer philosophy in regard to the whole problem of delinquency which has grown out of the studies and findings of the delinquency committee of the White House Conference on Child Health and Protection." 45 pp. 10c. (Apply to the Superintendent of Documents, Washington, D. C.)

Reports

A number of administrative report forms illustrating the type of information which city managers, mayors and departmental officials should receive at regular intervals are included in "Administrative Reports for Use in Managing Financial and Departmental Activities of Cities," prepared by the Research Division of the International City Managers' Association. 20 pp., mimeographed. (Apply to the Association, 923 E. 60th St., Chicago, Ill.)

County Government

"A Proposed Bill Providing for the Reorganization of the Government of Jackson County, Missouri," to simplify the organization, fix responsibility and make possible control over finances, was prepared in December, 1932, in 32 mimeographed pages, for the Civic Department of the Chamber of Commerce of Kansas City, Mo. (Apply to the Department.)

Unemployment Relief

The Russell Sage Foundation Library Bulletin No. 116, issued December, 1932, is on "Unemployment Relief in the United States and Canada," a bibliography of 12 pages, compiled by Margaret Otto; selected reference of recent date, including Federal, state and community relief; family problems, methods of relief giving, self-help, and allied topics. (Apply to the Foundation, 130 E. 22d St., New York.)

Pensions

"Financial Aspects of New York City's Pension Systems: A Program for the Reduction of Costs, Equalization of Benefit Provisions and Unification of the City's Pension Systems," prepared by Paul Studenski, Associate Professor of Economics, New York University, for the Citizens Budget Commission, 350 Madison Ave., New York. Jan. 3, 1933. 109 mimeographed pp. Many tables. (Apply to the Commission.)

Recreation

"The New Leisure, Its Significance and Use: A Selected Bibliography", compiled by Grace B. Thornton and published by the Russell Sage Foundation in the February, 1933, Bulletin of its Library (Number 117). 2 pp. 10c. (Apply to the Foundation, 130 E. 22d St., New York.)

Standards for Purchasing Agents

New standard specifications for the information of purchasing agents, current standardization movements affecting industry, and current research projects which may lead to standardization are all discussed in the "1933 Standards Yearbook" (seventh edition), compiled by the Bureau of Standards of the U. S. Department of Commerce. The activities and accomplishments of the bureaus and agencies of the Federal Government, the states and counties, and scientific and technical associations are outlined, and a list of state purchasing agencies is included. 255 pp. $1.00. (Apply to the Superintendent of Documents, Washington, D. C.)

Grade Separation

An article by Herbert S. Swan, city planner, has been reprinted from the February, 1933, issue of *Civil Engineering*, under the title, "Separating Grades at Highway Intersections," with the subtitle, "Experience to Date Emphasizes Advantages to Be Gained and Pitfalls to Be Avoided." Many illustrations are given of possible arrangements, and these are commented upon to show their relative utility. The pros and cons are summarized, and it is stated that "a separation with inadequate ramps exaggerates the embarrassing features of turning traffic and multiplies the number of left-hand movements across the paths of the straight traffic." (Apply to Mr. Swan, 15 Park Row, New York.)

Housing

"Bibliography on Building, Housing and Construction," prepared by the Construction Division, Civic Development Department, Chamber of Commerce of the United States, Washington, D. C. January, 1933. 32 mimeographed pp. This includes books, pamphlets and articles; a list of periodicals in the field, and one of associations, institutes, etc., concerned with the construction industry. Addresses are given in all cases. A practical, valuable document. (Apply to the Division.)

Smoke Nuisance

In the *Public Health Reports* for Feb. 3, 1933, there is an article by James E. Ives, Senior Physicist, Office of Industrial Hygiene and Sanitation, United States Public Health Service, on "Loss of Light Due to Smoke in Baltimore, Md., from October, 1929, to September, 1930." The method of the study was to record the daylight, by means of a photoelectric cell and a recording potentiometer, on the roof of a building in the smoky part of the city, and, similarly, at a point outside the city where the air was comparatively free from smoke. 12 pp. Graphs. The records showed a large relative loss of light due to smoke. In some cases the average hourly or daily loss was greater than 50 per cent. 5c. (Apply to Superintendent of Documents, Washington, D. C.)

Trees

The "Proceedings of the Annual Meeting of the Eighth National Shade Tree Conference," held in Rochester, N. Y., August 25-27, 1932, contains much interesting and important matter. Among the papers is one on "Tree Insurance," by E. P. Felt, of the Bartlett Tree Research Laboratories, Stamford, Conn. Another is "Design with Respect to Street Tree Planting," by L. D. Cox, Professor of Landscape Engineering, New York State College of Forestry, Syracuse, N. Y. The list given by Donald Wyman, of Cornell University, Ithaca, N. Y., of "Shrubs Which Withstand Shade and Are Hardy in Middle New York State" is of help to dwellers in many different localities. VII + 122 pp. (Apply to the Sec.-Treas. of the Conference, R. P. Marshall, Marsh Hall, Yale University, New Haven, Conn.)

Municipal Administration

A "Ten-Year Report of Municipal Progress" in the village of Kenilworth, Ill., has been assembled by F. L. Steed, Village Manager, in a pamphlet of 16 pages, reproduced from typewritten, illustrated material, well arranged and displayed. The early history of the village is given, and a number of "before and after" pictures show improvements and developments. Every division of the city service is presented, including the work of the Zoning Commission. (Apply to the Village Manager.)

Road Building

The Asphalt Institute (801 Second Ave., New York) has issued Manual Number Two in its Asphalt Road Construction Series, under the title, "Surface Treatment Types." This is a handy booklet of 128 pages, illustrated. It seeks to dispel the confusion which exists because of the terminology that has grown up through many years; to set forth the different methods commonly employed, within a few general groupings; to describe the principles and the proper procedure of "surface treatment," which is the term applied to wearing courses not more than one inch in thickness, obtained by the different methods. (Apply to the Institute.)

Taxation

"Double Taxation"—Preliminary Report of a Subcommittee of the Committee on Ways and Means Relative to Federal and State Taxation and Duplication Therein. Transmitted December 29, 1932, as a fact basis for a revision of the tax system as a whole in order that the tax burden may be more equitably distributed. The Subcommittee believes that the report shows the present system of taxation to be complicated, cumbersome, and in many respects inequitable, with many serious instances of double taxation or duplication in taxation with disappointing tax revenues, and a tax burden between the Federal Government and the states reaching the breaking point. X + 328 pp. Tables. 20c. (Apply to the Government Printing Office, Washington, D. C.)

The League of Kansas Municipalities has published (Dec. 20, 1932) its "1932 Tax Rate Book," which gives the tax rates and operation statistics for the 579 cities, the 579 city schools and the 105 counties of Kansas. An alphabetical directory of incorporated cities in Kansas is given, as of Aug. 15, 1932; showing the population as of April 1, 1932, the class of city, the county, the kind of electric service if any, and whether the city has gas and water service. Kansas shows an excellent municipal credit situation. 50 pp. (Apply to the League, Lawrence, Kans.)

Building Codes

The city of Cincinnati, Ohio, has enacted a new building code, effective April 1, 1933. The text contains, as detailed local regulations, 68 standardized regulations or approved provisions of 12 national and state technical organizations. Such inclusion tends to uniformity in municipal codes and gives the public and the building industry full advantage of large monetary and time expenditure by national scientific organizations in research, experiments and tests. Manufacturers of building products are thereby relieved from the necessity of providing special material and equipment to meet individual code requirements of different municipalities. Easy revision is facilitated by this method, because the date mentioned in the code can be amended to that of a new edition of the regulations of the organization referred to. (Apply to C. M. Stegner, Commissioner of Buildings, Cincinnati, Ohio.)

Ordinances

Small municipalities will welcome the Municipal Administration Service's Publication No. 29, "The Codification and Drafting of Ordinances for Small Towns," by John F. Sly, Jefferson B. Fordham, and George A. Shipman, Professors at West Virginia University. The ways and means of codification are discussed, and a comprehensive bibliography of "model" ordinances and material useful in ordinance making is included. 70 pp. 50c. (Apply to the Service, 309 E. 34th St., New York.)

Other Reports Received

HAWAII, TERRITORY OF.—Report of the Board of Water Supply, 1931-1932. 227 pp.

KANSAS CITY, MO.—Trends in City Finance in Kansas City, Mo., 1931-1932. Prepared by the Civic Research Institute, Kansas City. 26 pp., mimeographed.

OAK PARK, ILL.—Annual Report, Department of Public Works, 1932. 72 pp.

OAK PARK, ILL.—Annual Report, Water Department, 1932. 20 pp.

PALO ALTO, CALIF.—Annual Report, Health Department, 1932. 23 pp.

HOW ARE YOUR 35TH-YEAR PAVEMENTS?

Chicago's Ridge Avenue (Brick-Paved 1897) is in excellent condition, says its engineer, Walter A. Shaw

THIRTY-FIVE years ago, Walter A. Shaw, young engineer, designed and supervised building the brick pavement on Ridge Avenue, Chicago, between Devon and Howard Streets. The base was well compacted broken limestone.

Chicago has since become a world center. Automobile traffic has come. Lake Michigan's swift-changing climate has been ruthless.

Today, still engineer for the park district, Mr. Shaw views that early job with satisfaction. It is still in excellent condition.

He briefly describes the service of this pavement as follows:

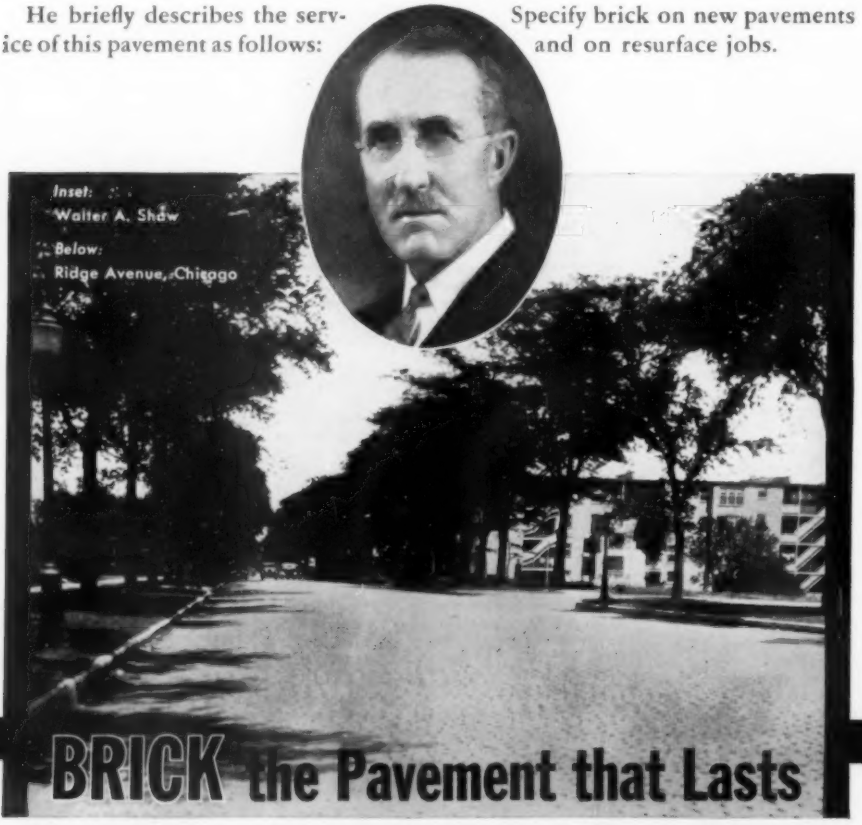
"In the early days there was heavy traffic over this street—coal trucks in particular. In recent years it has carried heavy automobile traffic. Many times the pavement has been opened and replaced for repairs of water, gas and sewage service.

"Yet after 35 years it is in excellent condition and apparently good for many more years."

* * *

It takes *brick* to produce paving records like Ridge Avenue. It is the pavement that withstands weather as well as traffic during the long life every pavement *ought* to give the taxpayers.

Specify brick on new pavements and on resurface jobs.



NATIONAL PAVING BRICK ASSOCIATION • 1245 NATIONAL PRESS BUILDING • WASHINGTON, D. C.

CONVENTIONS—WHEN AND WHERE

(Figures in parentheses following the name of the convention city indicate the estimated attendance other than local)

APRIL 7-8.—PHILADELPHIA, PA.
American Academy of Political and Social Science. Annual meeting. Secretary, J. P. Lichtenberger, 3457 Walnut Street, West Philadelphia, Pa.

APRIL 10-12.—GAINESVILLE, FLA. (120)
American Water Works Association—Florida Section. Annual meeting. Secretary, Louva G. Lenert, Chief Engineer, Florida State Board of Health, Jacksonville, Fla.

APRIL 10.—SCOTLAND NECK, N. C. (200)
Eastern Carolina Chamber of Commerce. Annual meeting. Secretary, N. G. Bartlett, Kinston, N. C.

APRIL 10.—NEW YORK. (350)
National Committee on Prisons and Prison Labor. Annual meeting. Secretary, Julia K. Jaffray, 250 West 57th Street, New York.

APRIL 13-15.—GAINESVILLE, FLA. (150)
Florida Engineering Society. Annual meeting. Secretary, W. W. Fineren, Gainesville, Fla.

APRIL 19-20.—ROCKFORD, ILL.
American Water Works Association—Illinois Section. Annual convention. Secretary, Professor J. J. Doland, University of Illinois, Urbana, Ill.

APRIL 20-21.—MONTGOMERY, ALA. (75)
Alabama League of Municipalities. Annual convention. Secretary-Treasurer, M. L. Robertson, Cullman, Ala.

APRIL 21-22.—HAVRE, MONT. (50)
American Water Works Association—Montana Section. Annual meeting. Secretary, Herbert B. Foote, State Board of Health, Helena, Mont.

APRIL 23-25.—JACKSONVILLE, TEXAS. (5,000)
East Texas Chamber of Commerce. Annual convention. General Manager, Hubert M. Harrison, Longview, Texas.

APRIL 23-28.—STILLWATER, OKLA.
Oklahoma Water and Sewage Conference. Annual conference. Secretary-Treasurer, H. J. Darcy, State Sanitary Engineer, Oklahoma City, Okla.

APRIL 24-27.—WASHINGTON, D. C. (1,100)
American Red Cross. Annual convention. Secretary, Mabel T. Boardman, National Headquarters, Washington, D. C.

APRIL 24-25.—BOSTON, MASS. (500)
Massachusetts Safety Conference. Secretary, Lewis E. MacBrayne, 6 Beacon Street, Boston, Mass.

APRIL 24, WEEK OF.—WASHINGTON, D. C. (100)
National League of Women Voters. National meeting. Executive Secretary, Beatrice H. Marsh, 532 17th Street, N. W., Washington, D. C.

APRIL 27-28.—WASHINGTON, D. C.
American Water Works Association—Four States Section. Annual meeting. Secretary-Treasurer, C. H. Becker, R. D. Wood & Co., 400 Chestnut Street, Philadelphia, Pa.

APRIL 27-29.—RALEIGH, N. C. (85)
Southern Commercial Secretaries' Association. Annual meeting. Secretary-Treasurer, Charles Ketchum, Greensboro, N. C.

APRIL 29—MAY 1.—RALEIGH, N. C. (50)
North Carolina Commercial Secretaries' Association. Annual meeting. Secretary, Howard B. Branch, Chamber of Commerce, Raleigh, N. C.

MAY 1.—WOONSOCKET, R. I.
New England Sewage Works Association. Spring meeting. Secretary, F. W. Gilcreas, 14 Beacon Street, Boston, Mass.

MAY 2-5.—WASHINGTON, D. C.
Chamber of Commerce of the United States of America. Annual meeting. Secretary, D. A. Skinner, 1615 H Street N. W., Washington, D. C.

MAY 4-5.—BALTIMORE, MD. (75)
Maryland-Delaware Water and Sewage Association. Annual conference. Secretary, A. W. Blohm, 2411 North Charles Street, Baltimore, Md.

MAY 11-12.—WASHINGTON, D. C.
American Road Builders' Association. Annual meeting. Engineer-Director, Charles M. Upham, National Press Building, Washington, D. C.

MAY 11-13.—BELLINGHAM, WASH. (115)
American Water Works Association—Pacific Northwest Section. Annual meeting. Secretary, Ernest C. Willard, 720 Corbett Building, Portland, Ore.

MAY 11-13.—BIG SPRING, TEXAS. (15,000)
West Texas Chamber of Commerce. Annual convention. Manager, D. A. Bandeen, Stamford, Texas.

MAY 16-19.—PITTSBURGH, PA. (250)
National Association of Public School Business Officials. Annual meeting. Secretary, John S. Mount, State Department of Public Instruction, Trenton, N. J.

MAY 17-18.—COLUMBUS, IND. (150)
Indiana Association of Chiefs of Police. Annual meeting. Secretary-Treasurer, A. G. Eversole, Sheriff, Lafayette, Ind.

MAY 25.—NEW YORK. (100)
National Board of Fire Underwriters. Annual meeting. General Manager, W. E. Mallalieu, 85 John Street, New York.

MAY 29—JUNE 1.—MILWAUKEE, WIS. (400)
National Fire Protection Association. Annual meeting. Managing Director, Franklin H. Wentworth, 60 Batterymarch Street, Boston, Mass.

JUNE 7-9.—HIBBING, MINN. (400)
League of Minnesota Municipalities. Annual convention. Executive Secretary, Morris B. Lambie, Director of the Extension Division, University of Minnesota, Minneapolis, Minn.

JUNE 11-17.—DETROIT, MICH. (4,500)
National Conference of Social Work and Affiliated Associations. Annual conference. General Secretary, Howard R. Knight, 82 North High Street, Columbus, Ohio.

JUNE 11-17.—DETROIT, MICH.
American Public Welfare Association. Annual conference held with National Conference of Social Work. Director, Frank Bane, 850 East 58th Street, Chicago, Ill.

JUNE 11-17.—DETROIT, MICH.
Association of Community Chests and Councils. Annual meeting held with National Conference of Social Work. Executive Director, Allen T. Burns, 1815 Graybar Building, New York.

JUNE 12-16.—CHICAGO, ILL. (1,200)
American Water Works Association. Annual convention. Secretary, Beekman C. Little, 29 West 39th Street, New York.

JUNE 12-14.—GALVESTON, TEXAS. (250)
City Marshals and Chiefs of Police Union of Texas. Annual convention. Secretary, George A. Smith, P. O. Box 299, Dallas, Texas.

JUNE 12-15.—BOSTON, MASS. (500)
National Association of Purchasing Agents. Annual convention. Secretary-Treasurer, G. A. Renard, 11 Park Place, New York.

JUNE 12-17.—CHICAGO, ILL. (1,200)
National Association of Real Estate Boards. Annual convention. Executive Secretary, Herbert U. Nelson, 59 East Van Buren Street, Chicago, Ill.

JUNE 13-15.—CINCINNATI, OHIO.
Municipal Finance Officers' Association of the United States and Canada. Annual meeting. Executive Director, Carl H. Chatters, 850 East 58th Street, Chicago, Ill.

JUNE 15.—DETROIT, MICH.
Child Welfare League of America, Inc. Annual meeting with the National Conference of Social Work. Executive Director, C. C. Carstens, 130 East 22d Street, New York.

JUNE 16-17.—LOUISVILLE, KY. (350)
American Automobile Association. Annual meeting. Executive Vice-President, Ernest N. Smith, Pennsylvania Avenue at 17th Street, Washington, D. C.

JUNE 20-22.—LEWISTON, MAINE. (800)
New England Association of Fire Chiefs. Annual convention. Secretary-Treasurer, John W. O'Hearn, 99 Main Street, Watertown, 72, Mass.

JUNE 21-22.—GALESBURG, ILL. (60)
Illinois Association of Sanitary Districts. Annual meeting. Secretary-Treasurer, G. H. Radebaugh, Urbana & Champaign Sanitary District, Urbana, Ill.

JUNE 26-30.—CHICAGO, ILL.
American Institute of Electrical Engineers. Annual summer convention. Assistant National Secretary, H. H. Henline, 33 West 39th Street, New York.

JUNE 26-30.—CHICAGO, ILL.
American Society for Testing Materials. Annual meeting. Secretary-Treasurer, C. L. Warwick, 1315 Spruce Street, Philadelphia, Pa.

JUNE 26-30.—CHICAGO, ILL. (1,500)
American Society of Mechanical Engineers. Semi-annual meeting. Secretary, C. W. Rice, 29 West 39th Street, New York.

JULY 1-7.—CHICAGO, ILL. (11,000)
National Education Association of the United States. Annual meeting. Secretary, J. W. Crabtree, 1201 16th Street, N. W., Washington, D. C.

JULY 31-AUGUST 3.—CHICAGO, ILL. (700)
International Association of Chiefs of Police. Annual convention. Secretary, George Black, Chief of Police, Wilmington, Del.

AUGUST 21-27.—SAILING FROM CLEVELAND TO CHICAGO. (600)
International Association of Fire Chiefs. Annual convention. Secretary, James J. Mulcahy, Yonkers, N. Y.

SEPTEMBER 5-7.—STATE COLLEGE, PA. (130)
Pennsylvania Sewage Works Association. Annual meeting. Secretary, L. D. Matter, Kirby Health Center, Wilkes-Barre, Pa.

SEPTEMBER 7-8.—NEW YORK. (200)
National Shade Tree Conference. Annual convention. Secretary-Treasurer, Dr. Rush P. Marshall, Yale University, New Haven, Conn.

SEPTEMBER 7-9.—STATE COLLEGE, PA. (200)
Pennsylvania Water Works Operators' Association. Annual convention. Secretary-Treasurer, I. M. Glace, 506 South Office Building, State Capitol, Harrisburg, Pa.

SEPTEMBER 17-20.—CHICAGO, ILL. (350)
American Institute of Park Executives and the American Park Society. Annual convention. Executive Secretary, William H. Walker, 2234 Inglewood Place, South Bend, Ill.

SEPTEMBER 18-20.—CHICAGO, ILL.
International City Managers' Association. Annual convention. Executive Director, Clarence E. Ridley, 923 East 60th Street, Chicago, Ill.

SEPTEMBER 21-23.—MILWAUKEE, WIS.
International Association of Public Works Officials. Annual convention. Secretary, A. M. Anderson, 100 North LaSalle Street, Chicago, Ill.

SEPTEMBER 24-27.—NEW YORK.
National Association of Commercial Organization Secretaries. Annual convention. C. M. Anderson, Executive Vice-President, Chamber of Commerce, Memphis, Tenn.

SEPTEMBER 26-29.—WILKES-BARRE, PA.
International Association of Municipal Electricians. Annual convention. Secretary, W. H. Harth, Columbia, S. C.

OCTOBER 2-6.—ATLANTIC CITY, N. J. (600)
National Recreation Association. Annual congress. Thomas E. Rivers, Administrative Secretary, 315 Fourth Avenue, New York.

OCTOBER 2-6.—CHICAGO, ILL. (3,000)
National Safety Council. Annual congress. Managing Director, W. H. Cameron, 20 North Wacker Drive, Chicago, Ill.

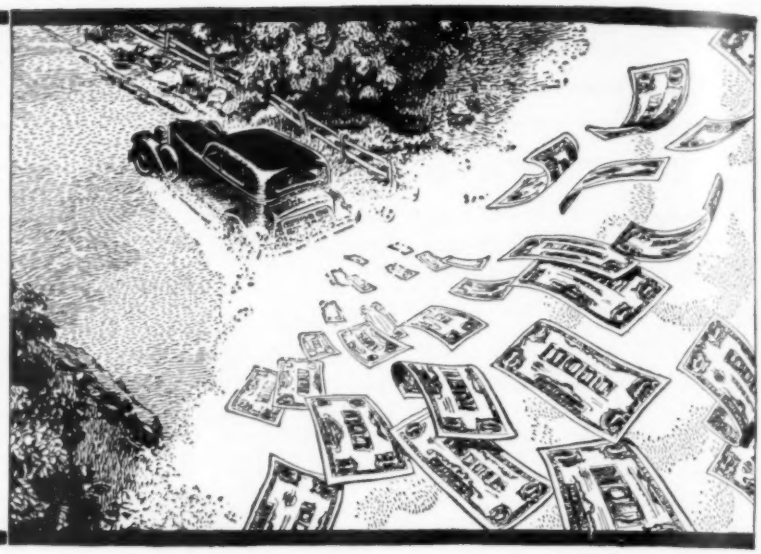
OCTOBER 9-12.—INDIANAPOLIS, IND.
American Public Health Association. Annual meeting. Executive Secretary, Dr. Kendall Emerson, 450 Seventh Avenue, New York.

OCTOBER 16-19.—OKLAHOMA CITY, OKLA. (350)
Southwest Water Works Association. Annual convention. Secretary-Treasurer, Lewis A. Quigley, Forth Worth, Texas.

OCTOBER 20-24.—OAKLAND, CALIF.
American Water Works Association—California Section. Annual convention. Secretary-Treasurer, R. F. Brown, P. O. Box 506, Stockton, Calif.

NOVEMBER 6-8.—STATESVILLE, N. C.
American Water Works Association—North Carolina Section. Annual meeting. Professor H. G. Baity, University of North Carolina, Chapel Hill, N. C.

This is not the time to let taxpayers' dollars go up in road dust



NEVER before has the expenditure of public moneys placed upon officials such a sharp responsibility for good management and wise economies. During the recent great era of prosperity the citizens of most every progressive community cheerfully pledged thousands of future tax dollars for improved roads. But money is no longer so plentiful. The means to highways adequate to traffic conditions must first regard low cost in construction and upkeep.

Many of the miles of improved highways are gravel-surfaced—a splendid and economical type of construction, but one which requires constant maintenance. Therefore, no "pruned" highway budget is truly economical if it fails to provide for adequate maintenance of these "secondary" roads. Permitting them to "ravel," become ground into dust and be washed, pushed and blown away is downright extravagance. It means rebuilding them years before it would otherwise be necessary.

What causes road surfaces to crumble and dust?

"The constant pounding of traffic," is the common answer. But by the rules of logic "pounding" really ought to pack stone and soil together all the more tightly. It will—*if they are kept moist.* But how? Rains are too infrequent. And constant sprinkling is out of the question. Nevertheless, there *is* a way: *Treat road surfaces with Calcium Chloride.*

This white, flaky, odorless, non-tracking substance *draws moisture out of the air*—and keeps the surface moist even on hot, dry days. It provides the ideal means for treating unbonded road materials in that it supplies moisture—the very thing needed to bind and compact the surface mat. The saving in many cubic yards of valuable road surface material per mile, per season, usually more than pays for the Calcium Chloride. In addition, Calcium Chloride reduces the blading and surface manipulation necessary to maintain a smooth riding surface. It also makes it possible to smooth up the roads in dry weather, when it would otherwise be impossible to do so effectively. Add to this the further advantage of eliminating traffic hazards, health menace and the discomfort of road dust.

The Calcium Chloride method of economically maintaining road surfaces and controlling road dust has already been proved on more than fifteen thousand miles of highway. Every highway engineer and other road official should know all about it. Try it out on a few miles if necessary to convince yourself. The results will be these: Less patching. Less adding of fresh surface materials. Fewer draggings. A longer-lasting, smoother and better riding road. . . . A definite saving in maintenance costs—and, in the end, less drain on the taxpayer's pocketbook and more credit to your managerial acumen.

For complete information about Calcium Chloride, write to any of the following members of the

● CALCIUM CHLORIDE ASSOCIATION

THE DOW CHEMICAL COMPANY . . . . . Midland, Michigan
SOLVAY SALES CORPORATION . . . 61 Broadway, New York City
THE COLUMBIA ALKALI CORPORATION . . . . Barberton, Ohio
MICHIGAN ALKALI COMPANY . . 10 East 40th St., New York City

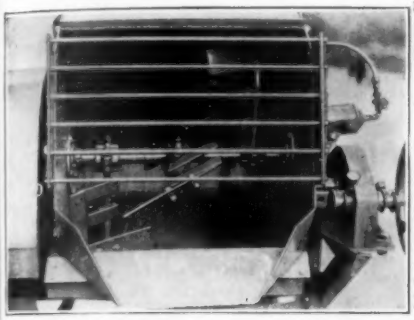
Calcium Chloride

NEWS AND ILLUSTRATIONS

Items of Interest to City, Town and County Officials, and Others Concerned with the Economical Construction and Efficient Operation of Public Improvement Undertakings

A Mixer Built for Cold Patch

A new cold patch mixer of the pug-mill type which will handle either emulsified or cutback asphalt without balling-up has been announced by the Chain Belt Co., Milwaukee, Wis. The machine is complete with a built-in but quickly detachable heater and will work with any type of asphalt or aggregate up to 2½ inches. The Rex cold patch mixer will mix a batch of emulsified asphalt in 20 seconds, and with its discharge mechanism insures a full batch every time. An extra-large hand wheel operating through a 7 to 1 gear reduction tilts the Rex drum into the discharging position and locks it automatically.



THE INTERIOR OF THE DRUM OF THE NEW REX COLD-PATCH MIXER

The Rex cold patch mixer has a capacity of 4 to 6 cubic feet of mixed material, depending upon the size, type of asphalt and aggregate used. The charging shield gives the drum ample capacity to handle 2½-inch aggregate satisfactorily. To meet the abrasive qualities of an asphalt aggregate mixture, this mixer is built with hardened liners that are renewable. The paddles are of high carbon steel with hardened steel scrapers that are adjustable to compensate for wear. It is powered with a 2-cylinder radiator-cooled 8-horsepower Le Roi engine or a 2-cylinder hopper-cooled 8-horsepower Le Roi engine equipped with high tension magneto. It is mounted on steel-spoke, rubber-tired roller-bearing wheels or steel-spoke, steel-tired wheels, and is built with a trailer mounting and a telescoping towing tongue.

New Distributors for Tuthill Highway Guard

The Tuthill Spring Co., 760 Polk Street, Chicago, Ill., has announced the appointment of the following new distributors: Lester Knight, Jr., 223 North Whasatch Avenue, Colorado Springs, Colo.; Paul Tholl, Sparks, Nev.; J. D. Evans Equipment Co., Rapid City, S. Dak.; J. V. Mullen, Parkersburg, W. Va.; D. H. Beckwith, Shorewood Hills, Madison, Wis.; and J. A. Fansler, Oklahoma City, Okla.

Water Mining Corporation Awarded Shell Contract

The Water Mining Corporation, Tulsa, Okla., has been awarded the contract for supplying the Shell Petroleum Company's properties at Arkansas City, Kans., with water by means of a single unit water mine. The capacity of the mine will be 4,000 gallons of water per minute, or approximately 6 million gallons per day.

The National Wood Pipe Co.

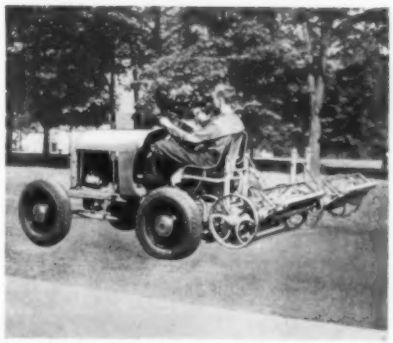
The National Wood Pipe Co., a new organization, has acquired the property formerly occupied by the Standard Wood Pipe Co. at Williamsport, Pa., and will manufacture and sell a full line of wood pipe for water-works systems, power plants and mines.

An Airport Ceiling Projector

A ceiling projector for determining the height of clouds at airports and weather bureau stations has been developed by the Westinghouse Electric and Manufacturing Co., East Pittsburgh, Pa. It is made of cast aluminum supported by a heavy steel bow and has a beam candlepower of over 3,000,000, using a 240-watt lamp. The optical system consists of a 16-inch commercial precision parabolic glass reflector, a precision glass secondary reflector and a ground and polished flat lens. A quadrant is mounted at the side of the unit for indicating all necessary angles of elevation.

This projector may be used with or without an alidade. When used with an alidade, it is set at an angle of elevation of 63° 26′, and the ceiling height is read directly on the alidade. If used without the alidade, it is set at an angle of 45°. The distance from the projector to the location directly beneath the spot on the ceiling is the same as the height of the ceiling.

THE WESTINGHOUSE CEILING PROJECTOR



THE WORTHINGTON PARKOVER GANG MOWER

A Tractor Gang Mower for Park Systems

A gang mower which is mounted on a tractor with rubber tires so that it may travel over a highway without marking the roadway, or can mount a 6-inch curb and travel at any desired speed from 5 to 15 miles per hour, is made by the Worthington Mower Co., Stroudsburg, Pa. The Worthington Parkover mower can be driven from one part of the park to another over roads and paths having cement curbs and gutters, which require that the mowing unit shall be raised out the way and that the tractor shall have pneumatic tires. The construction of this machine is based upon the patented Worthington machine of some years ago, but is brought up to modern practice and development. The unit can be raised at least 10 inches above the ground to clear all obstructions. The hoisting operation is done by a worm gear, the control for which is within reach of the operator. It takes but 30 seconds to raise the units, and when they are raised they are securely held in position.

The gang consists of three Worthington 30-inch standard mowers cutting a uniform swath over 85 inches wide. They are located within easy reach for adjustment, since they do not extend under the tractor's machinery or frame.

Arthur S. Tuttle Opens Office

Arther S. Tuttle, who resigned as Consulting Engineer of the Board of Estimate and Apportionment, New York City, in February, has opened an office as consulting engineer on municipal problems at 350 Madison Avenue, New York. Mr. Tuttle has been prominent in the development and study of construction problems affecting New York City, notably the plans for the Coney Island boardwalk, the elimination of the New York Central Railroad tracks from streets on the west side of Manhattan, the Ward's Island sewage treatment plant, and the West Side express elevated highway.

TRAFFIC MOVES ON FIFTH AVENUE

G-E Flexible-progressive Control Solves Unusual Traffic Problem

FIFTY-TWO intersections on busy Fifth Avenue, New York, are each signalized with special two-color, four-way bronze signals controlled by a complete intersection controller located in the base of a signal standard.

This equipment constitutes a flexible-progressive control system with a special supervisory controller. The outstanding flexibility of this system will enable the engineers of the Police Department to try as many timing arrangements as they desire, to determine what arrangement of coördinated timing will best suit New York's heavy traffic. We believe that no other traffic-control equipment on the market has so much facility of adjustment along this line.

Throughout the country, traffic engineers are finding that the progressive-flow system—particularly the flexible-progressive system—has many decided advantages over a system employing simultaneous change of signals.

It is significant that G-E composite control was chosen to control the section of heaviest traffic on one of the busiest streets in the world. Let our traffic control specialists assist you in selecting equipment to help solve *your* unusual traffic problems.

720-194H

GENERAL ELECTRIC

A New Solution Feed Device for Water-Works Chemicals

Both small and large water-works plants and experimental plants in which any kind of solution must be fed accurately have experienced some difficulty in securing the desired results. Phipps & Bird, Inc., 140 Virginia Street, Richmond, Va., have developed a solution feeder designed on the principle of the operation of a siphon, mounted on a parallel motion hinge and supported by a float. The solution flows from the main supply tanks into the feeder itself under the control of a float valve. This valve throttles the inflow of the solution to the rate at which the siphon is feeding. Variation of the flow through the siphon is obtained by adjusting the float on which the siphon is mounted, thereby changing the hydrostatic head under which the siphon operates. The output of the siphon is caught in a glass vessel which is constructed to serve both as a funnel and as a trap. When the supply to the feeder is stopped, the trap seals the open end of the siphon and causes the latter to remain primed.

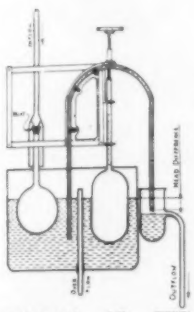


DIAGRAM OF THE PHIPPS & BIRD SOLUTION FEEDER

There is practically no cost of operation with this siphon. The machine should receive the care usually given to a mechanical device and should be cleaned at intervals. The frequency of the cleaning will depend on the character of the solutions which are being fed. Some solutions, naturally, will adhere to the parts more than others. The frequency of cleaning, therefore, must be left largely to the operator's judgment. It is claimed that the Phipps & Bird solution feeder will operate over definite periods with an accuracy of 1 per cent plus or minus. The Type A system is designed to meet the needs for continuous feeding with two tanks and a change-over valve which operates automatically when one tank is empty. The Type B system is designed for use at plants where continuous feeding is not necessary or desired and where the feeding is under supervision. The solution is prepared in an upper or mixing tank and is drawn into the lower or solution tank as needed. From this tank it passes through the feeder to the point of application.

Contractors' Name Omitted

In the article describing the Paris, Ky., water works in the October, 1932, issue of THE AMERICAN CITY, the name of the general contractors, Clarke, Stewart & Wood Co., Lexington, Ky., was inadvertently omitted. This firm of contractors was awarded the contract for changes and additions to filtration and pumping-plant buildings, basins, etc., as well as for building a new dam 17 miles upstream for a reserve supply of water. Boone Baldwin, City Managing Agent, reports, "We were well pleased with the construction work done by Clarke, Stewart & Wood and for this reason we are anxious to see due credit and consideration accorded them."

A Portable Public Address System

A public address system which can be carried about in a reinforced case, 25 inches long, 18½ inches high and 11 inches deep, finished in black leatherette and weighing 75 pounds complete with all equipment, including the microphone, stand, amplifiers, loudspeakers, cable, etc., has been developed by the RCA Victor Co., Inc., Camden, N. J. This type PG-62 portable public address system consists essentially of a velocity microphone, an amplifier and two loudspeakers all compactly housed in the rugged carrying case and so arranged that the equipment can be set up and placed in operation in a few minutes.

The system is capable of faithfully reinforcing or amplifying not only speech but music and, if desired, phonograph recording as well. The gain in speech presentation because of the quality and larger power handling capacity of this system makes it desirable for use in the average theater, municipal auditorium, ballroom, etc., having a seating capacity up to a maximum of 2,500 persons under normal acoustic conditions. The equipment and controls have been designed so that the actual operation of the system is as simple and convenient as that of an ordinary radio receiver, permitting it to be safely handled and operated by the ordinary layman.

The system equipment is entirely self-contained, and no additional apparatus or wiring is required other than a single connection to a source of 110-volt AC supply, as made available by the ordinary electric light socket or receptacle. The microphone is supplied with an adjustable desk stand that can also be used as a banquet table stand by employing the extra extension piece supplied. The microphone and stand are attractively finished in dull gun metal. A 30-foot shielded, rubber-covered microphone cable and a non-breakable plug are also supplied as part of the microphone equipment. The amplifier is a five-stage 20-watt output unit, employing Class B amplification. It is mounted on two separate bases in order to reduce hum to a minimum, by keeping the power supply separate from the voltage amplification stages. Two electro-dynamic loudspeakers of the cone type are mounted behind two grilled openings in the front half of the carrying case. These loudspeaker units are of rugged design and are capable of handling a maximum of 20 watts output. The units are mounted on a baffle at a slight angle in order to obtain maximum distribution. They are connected to the amplifier by a 30-foot rubber-covered cable, which with the 30-foot microphone cable permits the loudspeaker to be placed at any point within 60 feet of the microphone.

Theo. M. Martin Company Opens Offices

Theo. M. Martin Co. has announced the opening of offices at 5905 Pacific Boulevard, Huntington Park, Calif., for the handling of industrial advertising. The company is headed by Theo. M. Martin, formerly of Berry & Martin, Inc., and with him will be associated Wallace A. Sawdon and Lloyd C. Woods.

THE CARRYING CASE OF THE RCA-VICTOR PORTABLE PUBLIC ADDRESS SYSTEM

A 4-Star Steel Sheet for Quality Steel Signs

Superior Galvannealed steel sheets are an *improved metal* for all types of products where rust resistance, finish, workability and long life are important. Signs of all kinds—street signs, highway signs, road markers, etc.—made from Superior Galvannealed resist rust better, take the finish better and undergo severe forming and embossing without fracture of the coating.

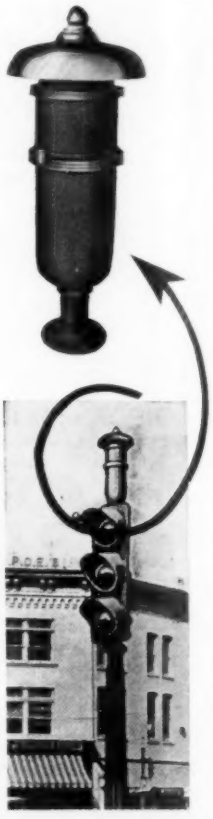
We shall be glad to refer you to a manufacturer who can supply your requirements for steel products made from Superior Galvannealed.

THE SUPERIOR SHEET STEEL COMPANY
CANTON, OHIO
Division of Continental Steel Corporation

- ★ Superior Galvannealed is a special analysis steel sheet.
- ★ A hot dip heat treated zinc coating is bonded to the base metal.
- ★ Coating will not chip, flake or peel under difficult forming or embossing.
- ★ Surface adapted to receive paint, lacquer or enamel finishes.

Superior Galvannealed
PATENTED PROCESS

SPEED TRAFFIC SAFELY *with* Duers Automatic Traffic Whistle



Easily attached to your present traffic signal system, the DUERS Whistle sounds exactly like a policeman's whistle. Its clear, sharp blast as the amber light comes on makes both driver and pedestrian more alert, and speeds up the traffic both in starting and stopping.

"A notable advance in automatic traffic control," say leading traffic engineers.

Write for illustrated booklet

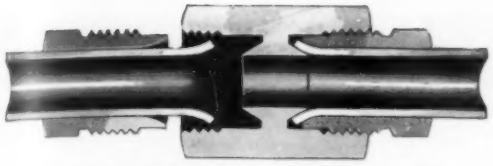
DUERS SIGNAL CO. Inc.
GLENS FALLS, NEW YORK

KEEP UNDESIRABLES OUT

Unprotected public property is easy prey for mischief makers, tramps, thieves and other undesirables. Keep them out by enclosing public works in Pittsburgh Chain-Link Fence. Made of rust-resisting, copper-bearing steel, heavily zinc-coated after weaving and erected on a sturdy frame of seamless steel pipe terminal posts and top rail and solid steel "H" section line posts, it will give many years of positive protection. Let us help you estimate the cost of fencing your property.

PITTSBURGH STEEL COMPANY
720 Union Trust Building
Pittsburgh, Pa.

Pittsburgh Fence



SECTIONAL VIEW OF THE DIEFORM TUBING UNION

Compression Fittings for Copper Tubing Water Services

Copper tubing is being accepted by more and more water departments and water companies for service connections between the mains and the house. Dieform compression fittings made by the Bailey Meter Co., 1050 Ivanhoe Road, Cleveland, Ohio, have been developed to permit quick coupling of lengths of copper tubing. These compression fittings when turned up give a leak-proof connection free from the possibility of rusting, because of the copper tubing. Since the joint is made without deformation of either the tube or the coupling, Dieform compression fittings may be used repeatedly. The joints are vibration-proof because in making the joints a slight molding of the tube and coupling parts produces a locking effect. These compression fittings provide the same area for the passage of the fluid as does the copper tubing itself. The quick flaring operation of the tubing instead of threading, and the comparatively few number of fittings required, and also the flexibility of the tubing, make an installation possible in approximately one-half the time required with rigid pipe.

Chip Spreaders and Year-Round Street Maintenance

Where cities are faced with a material change in climate, between winter and summer, there is a wide range of service which can be performed by the use of chip spreaders of the type of the Hercules-Ditwiler spreaders manufactured by the Ditwiler Mfg. Co., Galion, Ohio. In Denver, Colo., for instance, one of these machines was purchased in 1932 and two more in 1933. In the summer these machines are used for spreading fine sand on the oiled streets, and in the winter to spread sand on icy and slippery roads and streets. The machine can also be used for spreading calcium chloride on dusty roads where such conditions prevail. Thus this unit becomes an all-year ally of the street maintenance department.

SPREADING CALCIUM CHLORIDE WITH A DITWILER SPREADER

The auxiliary hopper is used only for this material which is hand loaded, because it must be kept bagged until used

An Improved Streamline Tire

Production has recently been started on an improved new type of tire, the 1933 streamline General Jumbo tire, a product of the General Tire & Rubber Co., Akron, Ohio. General has developed this tire on the same basic principles upon which streamline Jumbo tires have been built for more than a year. This new streamline Jumbo has been strengthened structurally. The basic principles of construction, regarded by tire engineers as revolutionary when introduced, have proved fundamentally correct, according to the General Tire & Rubber Co. The tire differs radically from all other types of conventional super-balloon or so-called "doughnut" tires. Its shape is pyramidal, its almost straight side-walls tapering from a tread no wider than that of the ordinary balloon tire it replaces, to a base wider than any other part of the tire. Built like a cantilever bridge, the tire has maximum stability because of its broad base, and the narrow tread makes steering and parking easy. The many side-wall prisms on the new tire slow down the reaction of air compression when the tire strikes bumps or depressions in the surface, snubbing the return shock and producing in effect "lazy-rubber" riding ease.

Cutless Rubber Bearings

The B. F. Goodrich Rubber Co., Akron, Ohio, has announced the appointment of Lucien Q. Moffitt, Inc., Peoples Bank Building, Akron, Ohio, as its exclusive distributor for Goodrich cutless rubber bearings in the United States and Canada. Mr. Moffitt, who has been manager of the cutless rubber bearing department of Goodrich since this new development in water-lubricated bearings was first placed on the market several years ago, heads the new distributor company.

Patzig Testing Laboratories Improves Facilities

Patzig Testing Laboratories, formerly located at 210 11th Street, Des Moines, Iowa, moved on April 1 to its new building at 2215 Ingersoll Avenue, Des Moines, Iowa. This new building, with larger, better and modernized facilities, makes it possible for these testing laboratories to meet increased requirements of the testing profession and to render better service in the examination, research and testing of oils, gasoline, fuels, minerals, metals, alloys, cement, concrete design, steel, lumber, clay and cement products, water, asphalt, tar, etc.

An Optimistic Message from an Old Timer

Edwin H. Ford, President, Ford Meter Box Co., Wabash, Ind., has sent a message to his many friends in the water-works industry which we believe merits repetition, and so we give it to our readers in the water-works field and throughout the municipal field in order that they may sense this spirit of courage and determination to carry on.

"My sons, who are in business with us, requested me to write a message to our many customers and friends. If they were not my sons I could dodge the task, but these young fellows are persistent and age must yield.

"I was in business and went through the panic of 1893. It was the indirect cause of my becoming a water-works superintendent and therefore of my later becoming a manufacturer of meter-setting equipment. The panic taught me many valuable lessons which have been useful in many ways in laying down the policies of our business.

"First, make something worth while. Stand behind it to the limit and sell it at a price that will continue to keep it up to a high standard, or improve it if experience and judgment dictate. Also, lay by from year to year a shock absorber to carry a business through such times as these.

"We are keeping our old customers and making new ones all the time. When their needs grow and small orders become larger ones, we will be in better shape than ever to take care of them.

"For over thirty years we have given good service, and we confidently expect to continue leading the van in our chosen line. Our business is not a job or a task—it is a pleasure."

A Cushion for Manhole Covers Prevents Rattling

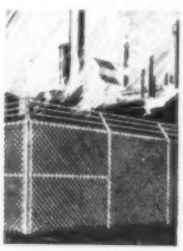
Rattling manhole covers are a nuisance to truck and automobile drivers, to pedestrians and to shops and residents nearby. A simple, easy and satisfactory means of eliminating complaints due to noisy manhole tops has been developed by the Philip Carey Co., Lockland, Cincinnati, Ohio. The Carey elastite cushion is a firm, resilient, durable, ring-shaped cushion, molded in one piece and made in sizes to fit any manhole frame. It is prepared in such a way that it cements itself in place upon its seat without adhering to the cover. It does not interfere with the removal of the cover, and it takes up inequalities in warped covers and prevents rattle and displacement. It definitely eliminates the use of pieces of old rope, scraps of burlap, chips of wood, and old inner tubes, which are unsatisfactory and temporary makeshifts.

A $3,000 Nap

Honest, trustworthy, was this watchman's record—yet, the "human element" took a costly toll—just as it does in hundreds of other similar instances.

Remember that your own building and grounds are not inviolate. That where the boundary lines are unprotected—trespassers, thieves, and malicious intruders may enter at will—tools and valuable material can be removed with but little effort.

Fortunately—the problem, though serious, is easily solved—dependable Cyclone Fence can rapidly and effectively be installed. Economical, too, because this superior safeguard costs so little per year of service without annual upkeep expense.



Made in a variety of styles to meet every need—and erected by factory-trained men if desired. Write for detailed information. Address Dept. A.

Cyclone—not a "type" of fence, but fence made exclusively by Cyclone Fence Company and identified by this trademark.

CYCLONE FENCE COMPANY
General Offices: Waukegan, Ill.
Branch Offices in All Principal Cities
SUBSIDIARY OF UNITED STATES STEEL CORPORATION
Pacific Coast Division
STANDARD FENCE COMPANY
Oakland, California

Cyclone Fence
REG. U.S. PAT. OFF.

SINCE 1867
COLDWELL

Above: Coldwell "Twin-Thirty" Motor Lawn Mower and Roller. Mows and rolls simultaneously 6 to 8 acres a day on one gallon of gasoline. Riding sulky may be had as extra equipment.

Combined Rolling and Mowing . . . Improves Turf . . . Cuts Expense

LET us give you full particulars of the 1933 Coldwell Dependable Power Lawn Mowers and Rollers.

There's a style and size to suit every lawn—Dependable performance guaranteed.

COLDWELL LAWN MOWER CO., NEWBURGH, N. Y., U. S. A.
In Canada—Taylor-Forbes Co., Ltd., Guelph
Manufacturers of ***DEPENDABLE*** *Lawn Mowers*—HAND, HORSE, GASOLINE, ELECTRIC

DOLGE *super strength* WEED KILLER

One application rids drives, walks, tennis courts and gutters of weeds for an entire season for less than 7c per 100 square feet.

Write for details, prices and free lease offer on all-steel sprinkling cart.

THE C. B. DOLGE CO., *Westport, Conn.*

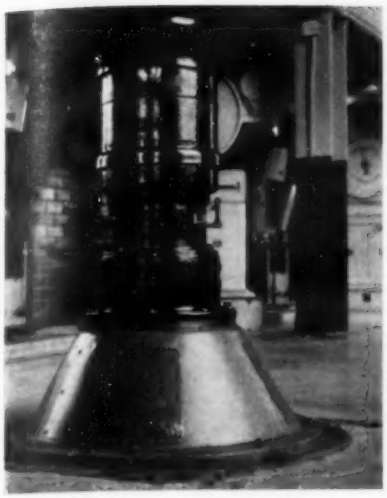
Install Stewart Fence

When fencing problems arise, good judgment dictates that you consider a manufacturer thoroughly experienced in the Fencing Line. Stewart has manufactured Fences of Iron and Chain Link Wire for all purposes for 47 years.

Consult the Stewart pages in THE MUNICIPAL INDEX and write us your needs.

The Stewart Iron Works Co., Inc.
915 Stewart Block, Cincinnati, O.

Stewart IRON AND WIRE FENCES



ONE OF THE MOTORIZED AGITATORS AT THE SPRING-WELL FILTRATION PLANT, DETROIT

Motorized Agitator Equipment for Detroit Filtration Plant

The accompanying illustration shows the type of motorized agitator equipment recently installed at the Spring-Well filtration plant in Detroit, Mich. A battery of these agitators was built by the Universal Gear Corporation, Indianapolis, Ind., each combining a 3-horsepower four-speed motor with a two-stage Universal Heliocentric Reducer of 900 to 1 ratio, in the compact integral unit illustrated. Four-speed motors were used, so that when tests of the untreated water show a high bacterial content, a large percentage of purifying chemicals may be introduced into the agitators, and the speed increased, in order that a uniform volume of water may be treated in a given period.

A New Power-Controlled Grader

Hydraulic power control for graders provides faster, smoother and easier means of leaning wheels, shifting the rear axle, and operating the blade, pole steer and scarifier. The Austin-Western Road Machinery Co., 400 North Michigan Avenue, Chicago, Ill., has recently announced the new Austin No. 12 grader with hydraulic power control. It carries a heavy 12-foot blade with railroad rail reinforcement, cuts 18 inches below ground level, has a high reach of 7 feet 10 inches, and can be raised into high-lift position in less than 3 minutes.

A rotary pump actuates the rams that work within double-acting, high-pressure cylinders, to move the various parts. The pump rotates constantly, but does not operate under load or against the relief value when the blade, wheels, etc., are in locked position. Both ends of the blade can be lowered or raised individually or simultaneously.

Other features of construction include a one-piece girder type frame of welded construction which permits a greater high-lift angle and a better view of the working blade. The wide-reach, telescopic blade lift arms have finished ball-and-socket joints. The Z-bar draft beam has a ball joint connection and a special lowering device; the line of draft is straight and direct and no power is applied through the frame. The engine hitch with a universal joint draft connection can rise or fall 44 inches from normal position. The extra-large diameter, one-piece cast steel circle is accurately machined for smoother operation. The axles have over-size drop-forged spindles, and are equipped with tapered roller bearings. The built-up front end of welded construction is flexibly designed to permit either front wheel to operate 36 inches above the other. The simplified rear end, using high-carbon steel angles, provides 20 inches of ground clearance.

Transportation for Water-Works Officials to Chicago Convention

The Water Works Manufacturers Association, Inc., 50 Church Street, New York, has announced the appointment of the following transportation committee for the 53rd annual convention of the American Water Works Association, to be held in Chicago, Ill., June 12-16, 1933. Chairman, John S. Warde, Rensselaer Valve Co., 50 Church Street, New York; C. R. Knowles, Illinois Central System, Chicago, Ill.; Theodore V. Wood, Leadite Co., Girard Trust Co. Building, Philadelphia, Pa.; William T. Field, Flower Building, Watertown, N. Y.; George M. Keefer, Rensselaer Valve Co., Oliver Building, Pittsburgh, Pa.

The Water Works Special train to Chicago, with the most modern type Pullman equipment, has been arranged for over the Pennsylvania Railroad by this Committee. The schedule calls for the train to leave the Pennsylvania Station, New York City, at 6:15 P. M. Saturday, June 10, operating on a fast schedule with no extra fare, picking up delegates en route and arriving in Chicago at 2:15 P.M., Sunday, June 11. Special reduced round-trip fares authorized for the Century of Progress International Exposition will apply, offering a far greater reduction than for previous conventions. Special folders are being arranged for and mailed to all members of the American Water Works Association, as well as the Water Works Manufacturers Association, giving fares not only from New York but from cities en route as far as Pittsburgh, Pa.

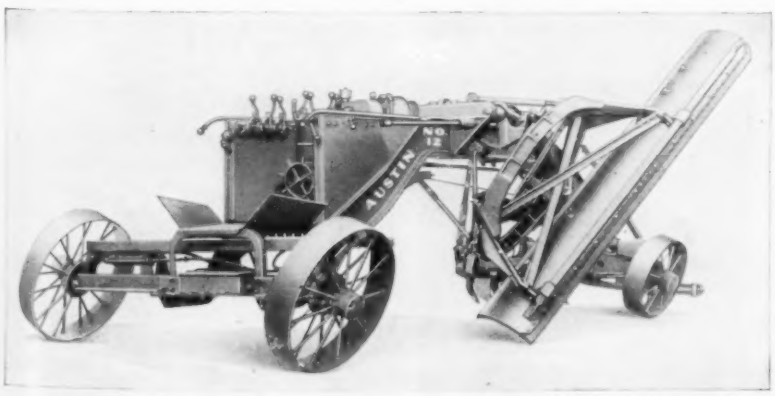
A Removable Catch-Basin Bucket

Various mechanical devices to avoid the objections to hand cleaning of catch-basins have been developed with various degrees of success and economy. The Garfield Sales Agency, 326 Lafayette Building, Detroit, Mich., has announced the Monarch catch-basin bucket, which sets in the catch-basin and has a pair of plungers arranged on opposite sides at the bottom, operating so as to break the mud vacuum as soon as a lift is exerted on the bucket bail.

The Monarch catch-basin bucket Model A is made of 10-gage, rust-resisting material, weighs 191 pounds, and has an outside diameter of 23½ inches and a height of 36 inches. Its capacity is 9 cubic feet.

Kelley Succeeded by Bradley as President of National Meter Co.

John C. Kelley, Jr., son of the founder of the National Meter Co., Brooklyn, N. Y., and its President since 1914, has retired from active management of the company to become Chairman of the Board. He is succeeded by F. J. Bradley, who has been in charge of the Chicago office.



THE AUSTIN-WESTERN HYDRAULIC-POWER-OPERATED GRADER, SHOWING THE BLADE AT A HIGH-LIFT ANGLE

Street Lighting to Be Developed

A new approach to the solution of street-lighting problems has been announced by the General Illumination Engineering Co., Carew Tower, Cincinnati, Ohio, for cities interested in obtaining the most economical and effective street illumination. This company has developed a complete consulting service to meet all the requirements of municipal street-lighting problems. General Illumination engineers are prepared to analyze these problems accurately and make impartial recommendations for obtaining better use of the light purchased by a city, more satisfactory contracts, and improved visibility in city streets. General Illumination service will remove the elements of chance and uncertainty in the preparation of street-lighting programs.

Outdoor Lighting

A Section of *The American City*
Devoted to the Lighting of Streets, Highways, Bridges, Airports, Athletic Fields and Parks, and the Floodlighting of Public Buildings

Easton, Pa., Makes Notable Improvement in Downtown Lighting

By NORMAN A. PEIL
Director of Public Safety, Easton, Pa.

NORTHAMPTON Street, the leading business thoroughfare of Easton, Pa., is now provided with highly modern street lighting. At the same time that this new lighting was installed, an improvement of a similar sort, but of still greater intensity, was carried out on Centre Square, in the heart of the city.

This entire installation was made as the result of a chain of circumstances, the chief of which was the necessity for repaving Northampton Street with a permanent surface. Several conferences were held between the Director of Public Safety and the street lighting department of the Metropolitan Edison Co., which supplies electricity in Easton.

Coordination of Improvements

It was realized that, when completed, this, the main street of the city, and a part of the commonwealth's already large highway system, would be a sealed book. To prevent spoiling its appearance in the near future by having to open up what would be an excellent surface, and also to avoid unnecessarily interrupting business along the street, the mayor and council agreed conclusively that now was the time to complete Northampton Street in its entirety.

For the lighting standards to be used on Northampton Street, design No. 4940 of the Union Metal Manufacturing Co. was chosen, using a 3-inch bracket and a pendent fixture, the General Electric Form 32 Novalux suspension luminaire, equipped with No. 146 globe. By using this fixture so that the light center is 22-feet above the roadway the best results were obtained. Fifty-eight 24-foot standards of this type are used.

The standard used in Centre Square and on the Circle is of the same design but 2 feet higher and with two brackets 22½ inches in length, and two of the Form 32 Novalux suspension luminaires are used. The same globes are used as on the single light standard. There are twenty standards of this type.

NORTHAMPTON STREET UNDER THE SUPERSEDED LIGHTING

NORTHAMPTON STREET WITH ITS NEW LIGHTING SYSTEM
The two standards in the foreground are the twin-light type used on Centre Square

Part of Ten-Year Plan

This installation is in accordance with the progressive street-lighting plan adopted by our city in an act of Council approximately a year and a half ago. The plan is of ten years' duration.

All the standards are equipped with 15,000-lumen lamps burning at 20 amperes. Each pole has its own transformer vault in the sidewalk, and each lamp a transformer. The vault, which has capacity for four IL type transformers, is square in shape, of cement construction with cast iron top, and is drained.

DAYTIME VIEW, SHOWING OLD LIGHTING FIXTURES

The old standards, installed about 20 years ago, were an excellent design for the time, but lacked the advantages of height, suspension mounting and better illumination provided by the new type

The standards are spaced 90 feet apart on the same side of the street, and are staggered with those on the opposite side. The street is a little less than 60 feet wide. Exceptional illumination is produced, the total increase amounting to 90,000 lumens.

The system has been in operation since the latter part of 1932, when it was inaugurated by a civic celebration. After a short address by Mayor F. C. Roberts, which was delivered by candlelight at 7:30 in the evening, the Mayor switched on the new lighting, transforming Northampton Street into a brilliantly illuminated thoroughfare. Mayors from many neighboring cities and state officials from Pennsylvania and New Jersey were present at the ceremony, which was followed by block dancing and a sidewalk carnival. Special window displays were arranged by the merchants of Northampton Street, and lights in the show windows were turned on simultaneously with those on the street.

ONE OF THE NEW LIGHTING STANDARDS IN EASTON

Illuminated Cascades in Oakland

THE CLEVELAND STREET CASCADES, OAKLAND, CALIF.

Cleveland Street between Merritt Street and Lakeshore Avenue is too steep for traffic and has been turned over to the Park Department, Lee S. Kerfoot, Superintendent. Steps were built for pedestrians, and a series of cascades, fed by artificial means, were installed. The cascades are illuminated in color by electric lights placed behind the shells at each side, appearing in the close-up view. The lights are arranged in spectrum sequence and give variegated and unusually attractive color effects

Courtesy of American Landscape Architect

More Evidence from Detroit

IN THE AMERICAN CITY for February, at pages 93 and 94, L. J. Schrenk, General Superintendent for the Public Lighting Commission of Detroit, Mich., set forth in detail the startling increase in traffic fatalities at night which followed the curtailment of street lighting, for reasons of economy, beginning January 1, 1932. He has now supplied us with comparative figures for the first two months of 1933, with street lighting restored practically to the 1931 level.

The increase in fatalities for the months of January and February in 1932 over 1931 was 21, or a percentage increase of 44.7 per cent. During the same period the day fatalities decreased from 18 to 9.

The months of January and February, 1933, when restored street lighting was in operation, show a decrease in night fatalities of 23 compared with 1932. This is a decrease of 33.8 per cent, practically reversing the comparative results of the same months of 1931 and 1932.

NUMBER OF PEOPLE KILLED FROM TRAFFIC ACCIDENTS IN DETROIT, MICHIGAN, FOR MONTHS OF JANUARY AND FEBRUARY

	Normal Street Lighting 1931	Curtailed Street Lighting 1932	Restored Street Lighting 1933
Day Fatalities.....	18	9	18
Night "	47	68	45
Total	65	77	63

Distinctive Lighting for Grand Central Parkway

A NEW seven-mile highway link, greatly improving the means of access from New York City to the boulevard system of the Long Island State Park Commission, is being constructed in the borough of Queens, extending from Kew Gardens, in that borough of Greater New York, to the city limits at the Queens-Nassau County line. It passes through the central portion of eastern Queensborough, and is known as the Grand Central Parkway. An unusually attractive lighting installation has been almost completed; it resembles the lighting on the famous Southern State Parkway of the Long Island State Park Commission, but uses larger lamps with higher mounting. A photograph of one of the standards and units for the new parkway is shown herewith.

The parkway passes through Hillside and Alley Parks. At Kew Gardens it connects with Union Turnpike and Queens Boulevard, and also with the proposed Grand Central Parkway Extension, which runs to the north through the meadows and connects with Northern Boulevard, affording access to the Triborough Bridge. It also connects with the Interborough Parkway, which will extend westward through Forest Park and connect with Highland Boulevard in Brooklyn. On the east, the Grand Central Parkway connects directly with the Northern State Parkway. It is being constructed by the state from state appropriations and from Federal highway funds provided by the Relief and Construction Act. The contracts were prepared and executed by the State Department of Public Works, with the approval of the Long Island State Park Commission.

TYPE OF LIGHTING STANDARD AND LUMINAIRE FOR GRAND CENTRAL PARKWAY, NEW YORK

The Parkway has a central express artery 44 feet wide, with 30-foot service roads on each side, with the areas between suitably landscaped. The service roads meet the cross arteries at grade, and the central express artery goes over or under the cross arteries by means of 13 bridges. The narrowest right-of-way is about 150 feet wide, and the widest about 500 feet.

The lighting installation was planned by the New York City Bureau of Gas and Electricity, of which Nicholas J. Kelly is Chief Engineer of Light and Power, and William G. Quirk, Supervising Chief Inspector in charge of street lighting. The actual installation is made by the New York & Queens Electric Light & Power Co., which will own and operate the lighting system under contract with the city. Rectangular Western red cedar poles are used, 28 feet 4 inches in total length, 21 feet 7½ inches of which is above ground. The luminaire is the General Electric Form 25C, equipped with Holophane refractor and Gleason-Tiebout light alabaster rippled globe suspended from a bracket; the light center is 2 feet 6 inches from the face of the standard and 18 feet 6 inches above the ground. The standards are placed in staggered arrangement, with an average spacing along the roadway of about 120 feet. Seven hundred of the units will use 300-watt lamps; 25 that are at various short underpasses will use 200-watt lamps. The system is expected to be placed in operation about July 1.

Drinking Fountains Combined with Lighting Standards in Buffalo Parks

AT various locations in the park system of Buffalo, N. Y., drinking fountains have been combined with lighting standards, in an attractive manner. A photograph of one appears herewith. According to R. J. Kinkel, Landscape Architect of the Department of Parks, there are twelve of these in the vicinity of tennis courts, baseball diamonds and other vantage points where they are sure to receive use. The fountains can be transformed into flower bowls by removing the bubblers, but so far this has not been done, all having been preserved for the convenience of the public in obtaining good drinking water.

The bowl is 33 inches in diameter and contains four bubbling cups. The rim is 37½ inches above the ground. The over-all height from the ground to the source of light is 11 feet 7 inches, the diameter of the shaft being 4 inches at the top and 6½ inches at the base. The standards were designed and made by the Union Metal Manufacturing Co. and are used with G. E. Form 8 Novalux luminaires.

DRINKING FOUNTAIN AND PARK LIGHT ON SOUTH DRIVE, DELAWARE PARK, BUFFALO, N. Y.

Street-Lighting Economics Discussed

AT the two-day Conference on the Economics of Applied Lighting held in February at Case School of Applied Science, Cleveland, Ohio, a comprehensive paper on "Economics of Street Lighting" was presented by L. A. S. Wood, Manager of the Lighting Products Division of the Westinghouse Electric & Manufacturing Co., at Cleveland. The results of various studies of the relation of street lighting to traffic accidents and to crime, and estimates of the cost of inadequate street lighting to the community, were cited; many of these have received attention in THE AMERICAN CITY. Reference to the experience of Detroit (see page preceding) was made, and it was brought out that while the direct saving caused by curtailing street lighting during ten months of 1931 was $100,000, the cost of handling traffic victims in the Receiving Hospital alone was reported as over $600,000.

Intangible benefits of good street lighting, as well as those that can be determined with a fair degree of definiteness, were given attention, and the conclusion was reached that expenditures for increased street lighting are truly self-liquidating in a broad sense. Copies of the paper can be had from the college.

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(See page 58)

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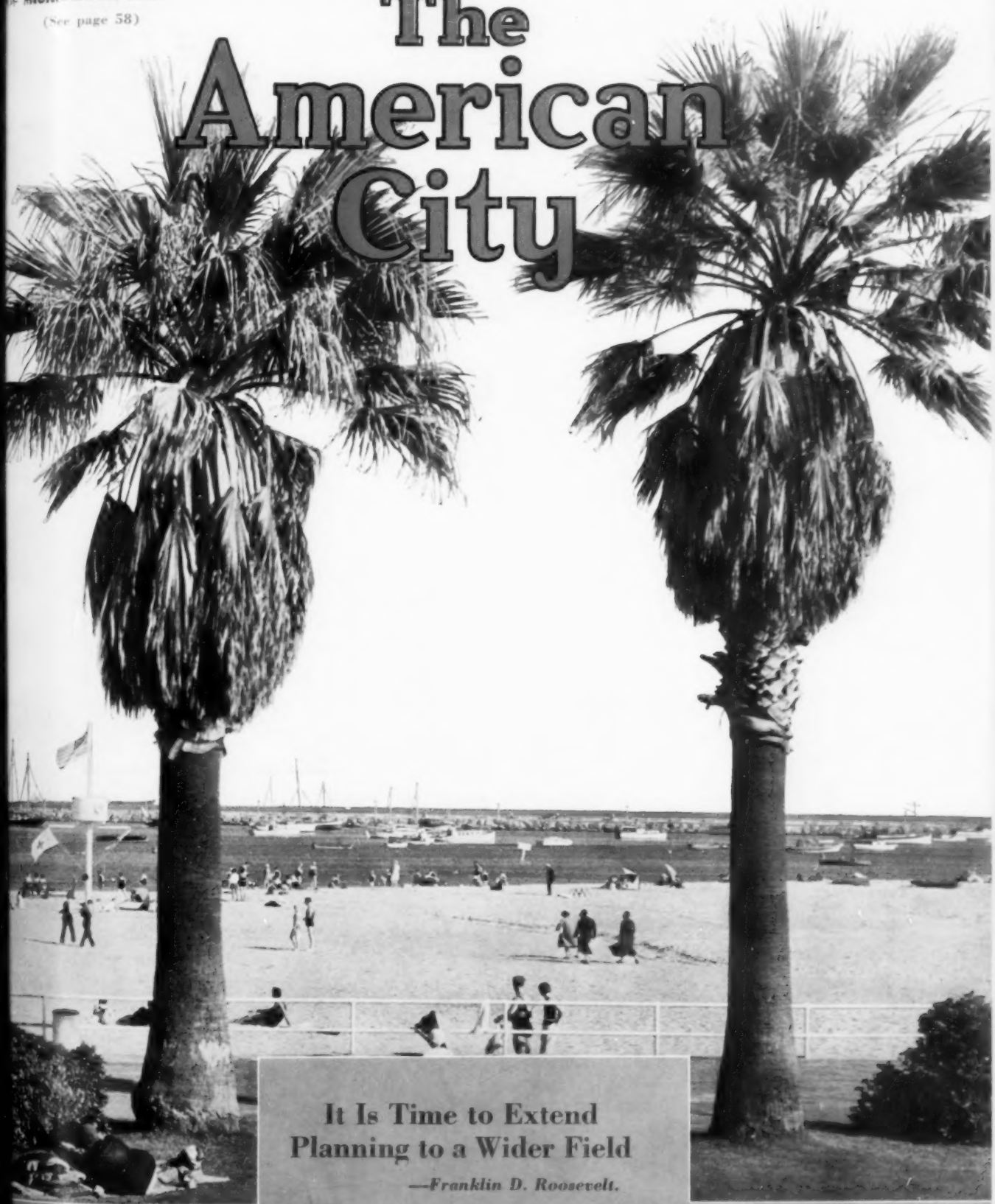
The American City



It Is Time to Extend Planning to a Wider Field

—Franklin D. Roosevelt.

rom coast to coast, these words from the Presi-t's message of April 10 are a challenge to public ials, civic organizations, and planning consultants. Mr. Roosevelt pointed out, "Many hard lessons e taught us the human waste that results from lack planning. Here and there a few wise cities and counties have looked ahead and planned. But our nation has 'just grown'."

The Administration is preparing to give substantial impetus to a nation-wide program of public works. Will the states, counties and cities be ready for prompt action with plans definite enough to merit Federal aid?